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Energy/Environment
Research and Development
Program Report

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EPA-600/7-77-003
January 1977

FISCAL YEAR 1976
CONTROL TECHNOLOGY
RESEARCH PROGRAM ABSTRACTS

Interagency
Energy/Environment
Research and Development
Program Report

Project Officer

Richard M. Laska
Office of Energy, Minerals and Industry
Office of Research and Development
Washington, D.C. 20460

OFFICE OF ENERGY, MINERALS AND INDUSTRY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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This report has been reviewed by the Office of Research and Development, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

This volume is one of two works. Together they contain project-level descriptions of nearly all of the $100-million in research and development funded by the EPA-coordinated Interagency Energy/Environment R&D Program in fiscal year 1976. This is the second year in which this office has prepared such a program listing. To make this year's effort more useful, we have coded the edges of the pages with marks. The wide marks indicate the Interagency Research category in which the project falls.

The project-level descriptions in this volume describe the environmental control technology research funded by the FY 1976 Interagency Energy/Environment R&D Program coordinated by the Office of Energy, Minerals and Industry. Each project is assigned to one of nine research, development, and demonstration categories:

- Energy resource extraction
- Physical and chemical coal cleaning
- Flue gas cleaning
- Direct combustion
- Synthetic fuels
- Nuclear
- Thermal
- Improved efficiency
- Advanced systems

Within each R&D category, program abstracts are grouped by agency. A table of contents has been provided at the beginning of each R&D category.

Project descriptions are culled from "Notice of Research Project" forms prepared by the appropriate laboratories and agencies using the Smithsonian Science Information Exchange (SSIE) format. The enclosed tables reflect the FY 1976 Interagency Program budget. Table 1 summarizes the funding for coal-related control technology R&D by agency and fuel cycle, while Table 2 summarizes the funding by energy cycle. Table 3 shows the EPA in-house funding breakdown by R&D category and Table 4 illustrates the Interagency Program funding by performing agency (EPA and pass-through). Tables 5-9 give the funding by fuel source for each agency (EPA, ERDA, DOI, USDA, and TVA respectively). Tables 10-18 depict the funding levels found within each of the nine control technology R&D categories. Table 19 lists the EPA and pass-through projects and project officers by performing agency, appropriate laboratory or division, and the program element.

In a companion volume, similar information on health and environmental effects of energy development addresses:

- Pollutant characterization, measurement, and monitoring
- Environmental transport processes
- Health effects
- Ecological effects
- Integrated assessment

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C. FLUE GAS CLEANING →

D. DIRECT COMBUSTION →

E. SYNTHETIC FUELS →

F. NUCLEAR →

G. THERMAL →

H. IMPROVED EFFICIENCY →

I. ADVANCED SYSTEMS →

ABSTRACT

This report includes SSIE (Smithsonian Science Information Exchange) abstracts pertaining to the FY 1976 Interagency Energy/Environment Research, Development and Demonstration Program being coordinated and managed by EPA's Office of Energy, Minerals and Industry. The abstracts are organized by the nine major control technology categories:

- Energy Resource Extraction
- Physical and Chemical Coal Cleaning
- Flue Gas Cleaning
- Direct Combustion
- Synthetic Fuels
- Nuclear
- Thermal
- Improved Efficiency
- Advanced Systems

This volume includes research being accomplished by EPA and its laboratories as well as a number of the participating agencies of the Federal Government.

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TABLE 1

[illegible]				
AGENCY: / FUEL CYCLE:	EXTRACTION	PROCESSING, TRANSPORTATION CONVERSION	UTILIZATION	TOTAL
[illegible]	2,110	(2,814 Coal Cleaning) (1,205 Synthetic Fuel) 4,309	(14,344 [illegible]) (4,217 [illegible]) (400 Thermal) 18,961	25,[illegible]
[illegible]	—	(150 Coal Cleaning) (1,050 Synthetic Fuel) 1,200	250 [illegible]	1,450
[illegible]	810	—	—	810
[illegible]	—	400 (Coal Cleaning)	—	400
[illegible]	—	—	(4,350 [illegible]) (400 Thermal) 4,750	4,750
TOTAL	2,920	7,[illegible]	23,961	33,[illegible]

*Not including staffing and support, FY 75 carryover, or headquarters supplemental funding.

[illegible]

[illegible]

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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]				[illegible]
[illegible]		[illegible]		[illegible]
	Soil Conservation Service	• [illegible]	[illegible]	[illegible]
	Agricultural Research Service	• [illegible]		[illegible]
	Forest Service	• [illegible]		[illegible]
[illegible]				[illegible]
[illegible]		[illegible]		[illegible]
	Bureau of Mines	• [illegible] • [illegible] • [illegible]	[illegible]	[illegible] [illegible] [illegible]
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		• [illegible]	[illegible]	[illegible]
[illegible]				[illegible]
[illegible]				[illegible]

TABLE 3

[illegible] INTERAGENCY ENERGY/ENVIRONMENT

FUNDING SUMMARY FOR FY '76 ($K)

[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
64 Energy Resource Extraction	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Energy Resource Extraction and Handling, Solid Fossil Fuels [illegible]	[illegible]	[illegible]	[illegible]
					[illegible] Energy Resource Extraction and Handling, Oil and Gas Production [illegible]	[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
65 Physical/Chemical Coal Cleaning	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Energy Control Technology Fuel Processing [illegible]	[illegible]	[illegible]	[illegible]
66 Direct Combustion	[illegible]	[illegible]	[illegible]	[illegible]				
67 Synthetic Fuels	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Energy Control Technology Fuel Processing [illegible]	[illegible]	[illegible]	[illegible]
[illegible] Nuclear Fuel Cycles	[illegible]	[illegible]	[illegible]	[illegible]				
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible] Flue Gas Cleaning	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Utility and Industrial Power [illegible]	[illegible]	[illegible]	[illegible]
[illegible] Thermal Control	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Utility and Industrial Power [illegible]	[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible] Improved Efficiency	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Energy Conservation and Advanced Systems [illegible]	[illegible]	[illegible]	[illegible]
[illegible] Advanced Systems	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Energy Conservation and Advanced Systems [illegible]	[illegible]	[illegible]	[illegible]
					[illegible] Waste as Fuel-Resource Recovery [illegible]	[illegible]	[illegible]	[illegible]
					[illegible] Energy Conservation and Advanced Systems [illegible]	[illegible]	[illegible]	[illegible]
					[illegible] Energy Conservation and Advanced Systems [illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
ENERGY/ENVIRONMENT TOTALS	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]

TABLE 4

FY 76 INTERAGENCY FUNDING SUMMARY FOR CONTROL TECHNOLOGY ($K)

	EPA	ERDA	DOI	TVA	NASA	Pass-Thru Total	Program Total
4a ENERGY RESOURCE EXTRACTION	[illegible][2]	[illegible][2]	—	—	[illegible][3]	[illegible]	[illegible]
4b PHYSICAL AND CHEMICAL COAL CLEANING	[illegible][2]	[illegible][1]	[illegible][3]	—	—	[illegible]	[illegible]
4c FLUE GAS CLEANING	[illegible][2]	—	—	[illegible][3]	—	[illegible]	[illegible]
4d DIRECT COMBUSTION	[illegible][2]	[illegible][2]	—	—	—	[illegible]	[illegible]
4e SYNTHETIC FUELS	[illegible][2]	[illegible][1]	—	—	—	[illegible]	[illegible]
4f NUCLEAR FUEL CYCLES	[illegible][2]	—	—	—	—	0	[illegible]
4g THERMAL CONTROL	[illegible][2]	—	—	[illegible][3]	—	[illegible]	[illegible]
4h IMPROVED EFFICIENCY	[illegible][2]	—	—	—	—	0	[illegible]
4i ADVANCED SYSTEMS	[illegible]	—	—	—	—	0	[illegible]
4Z TOTAL, CONTROL TECHNOLOGY	[illegible][4]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible][4]

1. Source: Objective Document
2. Source: Accomplishment Plan Plus Staffing and Support
3. Source: Interagency Agreement Accomplishment Plan
4. The totals do not reflect [illegible] in headquarters funds added onto EPA projects.

TABLE 5

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TABLE 11

[illegible]

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Energy Resource Extraction and Handling Oil and Gas Production [illegible]				
	1. [illegible]	[illegible]	[illegible]		Oil/Gas
	2. [illegible]	[illegible]	[illegible]		
	3. [illegible]	[illegible]	[illegible]		
	4. [illegible]	[illegible]	[illegible]	[illegible]	
	5. [illegible]	[illegible]	[illegible]		
	6. [illegible]	[illegible]	[illegible]		
	7. [illegible]	[illegible]	[illegible]		
	Subtotal	[illegible]	[illegible]		
	Energy Resource Extraction and Handling Solid Fossil Fuels [illegible]				
	1. [illegible]	[illegible]	[illegible]		Coal
	2. [illegible]	[illegible]	[illegible]		Coal
	3. [illegible]	[illegible]	[illegible]		Multi-Fuel
	4. [illegible]	[illegible]	[illegible]	[illegible]	Coal
	5. [illegible]	[illegible]	[illegible]		Oil Shale
	[illegible]	[illegible]	[illegible]		Nuclear
	[illegible]	[illegible]	[illegible]		Multi-Fuel
	Subtotal	[illegible]	[illegible]		
	[illegible] to Reduce Adverse Environmental Effects from Uranium Mill [illegible]				
	1. Provide technical [illegible] capability [illegible]		[illegible]		
	[illegible] Subtotal	[illegible]	[illegible]		
[illegible]	1. Reduce Adverse Environmental Effects from Uranium Mill Wastes.	[illegible]	[illegible]	[illegible]	Nuclear
[illegible]	1. Restore Coal Surface Mining: Vegetative Methods and Materials.	[illegible]			Coal
	2. Restore Coal and Oil Shale Mining: Vegetative Methods and Materials.	[illegible]			Coal/Oil Sh.
	3. Surface Manipulations for Enhanced Coal and Oil Shale Mine Vegetation.	[illegible]			Coal/Oil Sh.
	Subtotal	[illegible]	[illegible]	[illegible]	
	[illegible] TOTAL	[illegible]	[illegible]	[illegible]	

Footnotes:

[illegible]

TABLE II

ENERGY/ENVIRONMENT INTERAGENCY PROGRAM, FY 76 FUNDING ($K)

a) PHYSICAL/CHEMICAL COAL CLEANING ([illegible])

AGENCY	PROJECT [illegible]	[illegible] $K	[illegible] $K	[illegible] $K	STATUS
[illegible]	1. Environmental Assessment (IERL-RTP)	1,390	986		Cont.
	2. Control Technology Development (IERL-RTP)	1,525	1,481		↕
	3. Process Measurements Support (IERL-Cinn.)	357 (1/3)	357 (2/3)		↕
	4. Special Studies - (IERL-RTP)	50 (1/3)	346 (2/3)		↕
	5. Process Measurements Support and Special Studies - (IERL-Cinn.)	30 (1/3)	—		↕
	SUB TOTAL	[illegible]	[illegible]		Cont.
[illegible]	1. Control Technology Development	930	931		Cont.
	a. Coal Washing Test Facility			300	
	b. Coal Cleaning Technology Development			300	
	c. Coal Cleaning Waste Disposal and Refuse	—	—	300	
	SUB TOTAL	930	931	900	
[illegible]	1. Control Technology Development	150	150		Cont.
	SUB TOTAL	150	150		
	PROGRAM CATEGORY TOTAL	[illegible]	[illegible]		Cont.

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		[illegible]
	[illegible]		[illegible]		[illegible]
	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]			[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	

[illegible]

TABLE II

ENERGY/ENVIRONMENT DEVELOPMENT PROGRAM FY 76 FUNDING ($K)

[illegible] COMBUSTION (OCT & [illegible])

[illegible]	PROGRAM AND LAB	[illegible] $K	[illegible] $K	[illegible]	FUEL(S)
[illegible]	1. Fluidized-Bed Combustion - Environmental Assessment (IERL-RTP)	1,250	1,040		Coal
	2. Fluidized-Bed Combustion - Control Technology Development (IERL-RTP)	3,000	2,220		Coal
	3. Advanced Oil Processing - Chemically Active Fluid Bed Residual Oil Cleanup (IERL-RTP)	1,800	1,785		Oil/Gas
	4. Special Studies - Technical Evaluation (IERL-RTP)	75(1/3)	266		Coal
	5. Process Measurements Support (IERL-RTP)	237(1/3)	197		Coal/Oil/Gas
	SUBTOTAL	6,337	6,033		
[illegible]	1. Fluidized-Bed Combustion - Control Technology Development	250	250		Coal
	PROGRAM CATEGORY TOTAL	6,587	6,283		

TABLE 14

ENERGY/ENVIRONMENT INTERAGENCY PROGRAM, FY 76 FUNDING ($K)

[illegible] SYNTHETIC FUELS ([illegible])

AGENCY	PROJECT AND TASK	O.S. $K	A.P. $K	[illegible]	FUEL(S)
EPA	1. Synthetic Fuels from Coal – Environmental Assessment (IERL-RTP)	[illegible]	[illegible]		Coal
	2. Synthetic Fuels from Coal – Control Technology Development (IERL-RTP)	[illegible]	[illegible]		Coal
	3. Advanced Oil Processing – Environmental Assessment (IERL-RTP)	[illegible]	[illegible]		Oil/Gas
	4. Advanced Oil Processing – Technology Development (IERL-RTP)	[illegible]	[illegible]		Oil/Gas
	5. Oil Shale (IERL-Cinn.)	[illegible]	[illegible]		Oil Shale
	6. Process Measurements Support (IERL-RTP)	[illegible]	[illegible]		Coal/Oil/Gas
	7. Process Measurement Support and Special Studies (IERL-Cinn.)	[illegible]	[illegible]		Coal/Oil/Gas
	8. [illegible] Synthetic Fuel Production and Utilization (IERL-Cinn.)	-	[illegible]		Waste Fuel
	9. Special Studies (IERL-RTP)	[illegible]	[illegible]		Coal/Oil/Gas
	10. [illegible] Control (IERL-RTP)	[illegible]	[illegible]		Coal/Oil/Gas
	TOTAL	[illegible]	[illegible]		
ERDA	1. Synthetic Fuels from Coal – Environmental Assessment	[illegible]	[illegible]		Coal
	2. Synthetic Fuels from Coal – Control Technology Development	[illegible]	[illegible]		Coal
	TOTAL	[illegible]	[illegible]		
	PROGRAM CATEGORY TOTAL	[illegible]	[illegible]		

TABLE 15

ENERGY/ENVIRONMENT INTERAGENCY PROGRAM, FY 76 FUNDING ($K)
OF NUCLEAR (033a, CEP)

AGENCY	PROGRAM AND LAB	[illegible]	[illegible]	FUEL(S)
EPA	Subobjective Summary: Nuclear Waste Control (Ex. Mining and Milling) IERL-Cinn.	500		
	1. Assessment of Environmental Impact and Analysis of Control Technologies for Radioactive Materials Associated with Thorium/Uranium - 233		0	Nuclear
	2. Updating and Extending the Technology Assessment Methodology for Radioactive Waste Management		0	
	3. Evaluation of Problems and Limitations of Ocean Dumping as a Radioactive Waste Management Alternative		65	
	4. Improving Model for Simulating Groundwater Transport of Radioactive Pollutants from Buried Low-Level Radioactive Wastes		125	
	5. Definition of the Radon - 222 Source Level from Uranium Wastes		60	
	6. Management and Engineering Study for Commercial Low-Level Burial Sites		80	
	7. Assessment of Radionuclide Retention in Soils		75	
	8. Control of Radiological Impacts from Recovery of Uranium from Phosphate and Other Mineral Ores, Products, By-Products and Wastes		103	
	9. Emergency Response Planning for a Nuclear Incident at a Fixed Nuclear Facility		25	
	SUBTOTALS	500	533	
	1. Process Measurements Support and Special Studies		60[1]	
	PROGRAM CATEGORY TOTALS	500	593	

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[1] Funding for this subobjective was 120 for '76 and 60 for 76a. Interview with Kurt Jakobson on 8/17/76 directed that work and funding be divided 50:50 between oil shale and nuclear.

TABLE 16

[illegible]
[illegible]

AGENCY	PROJECT AND LAB	[illegible]	[illegible]	[illegible]	REMARKS
EPA	1. Thermal Pollution Control-Cooling Technology [illegible]	[illegible]	[illegible]	↑	[illegible]
	2. Thermal Pollution Control-Waste Heat and Water Utilization [illegible]	[illegible]	[illegible]	[N.A.]	[illegible]
	3. Development of [illegible] Control Technology for Stationary Sources [illegible]	[illegible]	[illegible]	↓	[illegible]
	SUB TOTAL	[illegible]	[illegible]		
TVA	1. TVA Thermal Pollution Control Program [illegible]	[illegible]	[illegible]	[illegible]	
	SUB TOTAL	[illegible]	[illegible]	[illegible]	
	[illegible] TOTAL	[illegible]	[illegible]	[illegible]	

TABLE 17

[illegible]

[illegible]

AGENCY	PROGRAM AND TASK	[illegible]	[illegible]	NOTES
	ENVIRONMENTAL ASPECTS OF ENERGY CONSERVATION METHODS AND ADVANCED ENERGY SYSTEMS			
EPA	1. Environmental Assessment of Energy-Conserving Processes and Techniques (EPA-Cin.)	[illegible]	[illegible]	Conserv
	2. Development of Energy-Efficient Pollution Control Technology for Industrial Processes (EPA-Cin.)	[illegible]	[illegible]	Conserv
	3. Wastes as Fuel: Pollutant Criteria and Characterization (EPA-Cin.)	[illegible]	[illegible]	Waste-Fuel
	4. Wastes as Fuel: Industrial Waste Survey (EPA-Cin.)	0	0	Waste-Fuel
	5. Wastes as Fuel: Waste Co-Firing with Coal or Other Wastes (EPA-Cin.)	[illegible]	[illegible]	Waste-Fuel
	6. Wastes as Fuel: Waste Co-Firing with Oil (EPA-Cin.)	[illegible]	[illegible]	Waste-Fuel
	7. Wastes as Fuel: Thermochemical Conversion (EPA-Cin.)	[illegible]	[illegible]	Waste-Fuel
	8. Wastes as Fuel: Air Pollution Controls (EPA-Cin.)	[illegible]	[illegible]	Waste-Fuel
	9. Wastes as Fuel: [illegible] (EPA-Cin.)	25	25	Waste-Fuel
	10. Environmental Assessment of Advanced Cycles (EPA-Cin.)	[illegible]	[illegible]	Conserv
	11. Process Measurements Support and Special Studies (EPA-Cin.)	[illegible]	[illegible]	
	12. Indoor Air Quality – Assessment and Control of Pollutants (EPA-RTP)	0	[illegible]	
	13. Wastes as Fuel – Pollutants Studies (DOE)	[illegible]	[illegible]	Waste-Fuel
	14. Wastes as Fuel – Waste Surveys (DOE, [illegible])	250	250	Waste-Fuel
	15. Wastes as Fuel – Technical Assistance (DOE, [illegible])	0	[illegible]	Waste-Fuel
	16. Wastes as Fuel – Materials Recovery R & D (DOE)	0	0	Waste-Fuel
	17. Wastes as Fuel – Fuel and Feedstock Preparation (DOE)	[illegible]	[illegible]	Waste-Fuel
	18. Wastes as Fuel – Waste Co-Incineration (DOE)	75	0	Waste-Fuel
	19. Wastes as Fuel – Biological Conversion R & D (DOE)	[illegible]	[illegible]	Waste-Fuel
	20. Wastes as Fuel – Program Management (DOE)	0	25	Waste-Fuel
	PROGRAM ELEMENT TOTAL	[illegible]	[illegible]	

TABLE 19

ENERGY/ENVIRONMENT INTERAGENCY PROGRAM, FY 76 FUNDING ($K)
62 ADVANCED SYSTEMS (624B, 624C, 62A, 62C)

AGENCY	PROGRAM AND LAB	O.S. $K	A.P. $K	TAG	USER(S)
EPA	Environmental Aspects of Energy Conservation Methods and Advanced Systems (624B, IERL-Cinn.)				
	1. Geothermal Control Technology Assessment	90	99		Geotherm
	2. Solar Energy Use Environmental Assessment	25	60		Solar
	Geothermal Environmental Impact Assessment (624C, ERL/NERC/Las Vegas)				
	1. Geothermal Environmental Impact Assessment (Coordinate U.S.)	125	100		Geotherm
	TOTAL	240	259		
	PROGRAM CATEGORY TOTAL	240	259		

TABLE 19
(Continued)

EPA AND PASS-FUNDED PROJECTS AND PROJECT OFFICERS FOR THE SUPPLEMENTAL INTERAGENCY ENERGY/ENVIRONMENTAL PROGRAM IN CONTROL TECHNOLOGY

(Continued)

Performing Agency	Lab./Subdivision	Project Officer (Performing Agency)	Identification Number	Program Element Title	FY 1978 Funding ($K) I.P.	[illegible]	U.S. Supplement	Total
BOM	Bureau of Mines		[illegible]	Physical/Chemical Coal Cleaning Technology Development	[illegible]			[illegible]
			[illegible]	Coal Washing Test Facility	[illegible]			[illegible]
			[illegible]	Coal Cleaning Waste Disposal and Reuse	[illegible]			[illegible]
	SUBTOTAL				[illegible]			[illegible]
TVA		[illegible]	[illegible]	Fly Ash Characterization and Disposal	[illegible]			[illegible]
		Hollis B. Flora II	[illegible]	Characterization of Effluents from Coal-Fired Utility Boilers	[illegible]			[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
	SUBTOTAL				[illegible]			[illegible]
	Test and Demonstration Branch	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
	Design Branch, Division of Chemical Development	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
	"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
	"	H. L. Faucett	[illegible]	[illegible]	[illegible]			[illegible]
	"	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]
	"	Hollis B. Flora II	[illegible]	[illegible]	[illegible]			[illegible]
	SUBTOTAL				[illegible]	[illegible]		[illegible]
	TVA TOTAL				[illegible]	[illegible]		[illegible]
USDA			[illegible]	[illegible]	[illegible]			[illegible]
			[illegible]	[illegible]	[illegible]			[illegible]
			[illegible]	[illegible]	[illegible]			[illegible]
	SUBTOTAL				[illegible]			[illegible]
	TOTAL				[illegible]	[illegible]	[illegible]	[illegible]

A. ENERGY RESOURCE EXTRACTION

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TABLE OF CONTENTS

Energy Resource Extraction

Agency	Pages
EPA	1-35
ERDA	36-41
USDA	42-45

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

ROAP [illegible]

[illegible]

TITLE OF PROJECT

Longterm Evaluation of the Elkins Project

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Richard Tufner, Principal Investigator

NAME AND ADDRESS OF APPLICANT INSTITUTION

PEDCo Environmental
Suite 13, Atkinson Square
Cincinnati, Ohio 45246

SUMMARY OF [illegible]

Elkins Demonstration Project No. 1 was the first large scale reclamation effort undertaken by EPA and its predecessor Agencies. Work was completed in 1971. This effort will evaluate the project now that five years have elapsed. The final report to be prepared will detail all work accomplished, present initial results, and evaluate the longterm reclamation effects.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by John E. Martin	DATE 8/76

FOR OFFICE USE ONLY

[illegible]	TASK NO. 1 A	PROJECT OFFICER Ronald D. Hill 684-4410 [illegible] IERL-Cincinnati, Cincinnati, OH 45268

[illegible] $32,000	[illegible] 76	[illegible] 0	STARTING DATE 10/75	[illegible] DATE 10/76

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

[illegible]

TITLE OF PROJECT:
Modified Block Cut Utilizing On-Site Control of Surface Mine Sedimentation

PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:
Robert E. Nichols, Chief, Office of Planning and Research
Danny A. McClain, Project Coordinator, Office of Planning and Research

NAME AND ADDRESS OF INSTITUTION:
Kentucky Department for Natural Resources and Environmental Protection
5th Floor Capital Plaza Tower
Frankfort, Kentucky 40601

SUMMARY:

It is proposed to demonstrate that the modified block cut method of surface mining will provide for on-site control of sedimentation. The project will demonstrate the importance of preplanning process as an integral part of the control process. Techniques to be considered are (1) minimizing the area disturbed by eliminating the overfall and stripping small sections at one time, (2) controlling the flow of water above the mined area by the use of a diversion terrace, (3) vegetative "filter" on terraces below site, (4) returning the soil to its original grade eliminating the highwall and (5) immediate seeding and mulching.

[illegible]	Signature of Project Officer	Date 6/10/75
[illegible]	FILE NO. 18	Project Officer D. Jackson Hubbard [illegible] Cin., Ohio [illegible]
[illegible]	[illegible]	STARTING DATE 10/1/75
		ESTIMATED COMPLETION DATE 7/30/78

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE
CBO

TITLE OF PROJECT
Snowy Creek - Laurel Run Watershed Demonstration Project Feasibility

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

See Attached Schedule "A"

NAME AND ADDRESS OF APPLICANT INSTITUTION
Division of Water Resources, Dept. of Natural Resources, State of West Virginia,
1201 Greenbrier Street, Charleston, West Virginia 25311

SUMMARY OF PROPOSED WORK [illegible]

The objective of the study is to demonstrate the feasibility of and the methods by which mine drainage pollution maybe abated from abandoned mine workings in areas with badly fractured, shallow overburden.

The program will consist of: (1) determining the extent of mining within the study area to assess the interrelation of the various workings; (2) surface and subsurface exploration to evaluate the type and structural condition of the materials encountered; (3) monitoring of discharges and streams for quality and quantity of flows; and (4) evaluation of specific abatement techniques for the problems encountered.

Snowy Creek - Laurel Run watershed in Preston County, West Virginia was selected for the proposed demonstration project because: (1) the area is relatively small, but has been extensively strip and deep mined, (2) significant portions of the watersheds have shallow, badly fractured overburden, and (3) the watershed is located in the headwaters of the Youghiogheny River which is being evaluated by others under the Wild and Scenic Rivers Act (P.L. 90-542).

N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE March 9, 1973

FOR OFFICIAL USE ONLY

[illegible]	[illegible] 8 D	PROJECT OFFICER Robert B. Scott [illegible] 1BB1-04

FUNDS REQUESTED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
84,000	74	0	8/73	12/75

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

CEC

TITLE OF PROJECT:

Evaluation of the Cost Effectiveness of Aquifer Dewatering

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Frank C. Kresse, Manager of Engineering Geology
W. Roger Hall, Project Director, Geology Dept.
James V. [illegible], Project Hydrogeologist, Geology Dept.
James F. Connell, Manager of Mining Engineering

NAME AND ADDRESS OF APPLICANT INSTITUTION

W. A. Wahler & Associates
1023 Corporation Way - P.O. Box 10023   Palo Alto, California 94303

SUMMARY OF PROPOSED WORK [illegible]

Objective - Determine the economic benefits, if any, of intercepting ground-water inflow into an active coal mine with emphasis on reducing the amount of acid mine drainage.

Approach - Review the state-of-the-art in active coal mine dewatering technology by literature search and interviews with key government and industrial personnel. Select several potential sites that lend themselves to development of a pilot-scale dewatering project to support a feasibility study. Prepare plans and specifications and determine the feasibility for conducting the pilot project at the best available site.

Establish baseline data for the site selected by research, field exploration, sampling and testing for hydrogeologic, hydrologic and other parameters. Construct and operate the pilot dewatering project to generate the technical and economic data required to evaluate the method and degree of interception of ground-water inflow to an operating mine that is practical and economically feasible.

Current Plans - A literature search is underway to develop a background of current coal mine dewatering technology. A candidate list of potential sites is being prepared and site visits are planned in February and March, 1976. Site selection, pilot project plans, EPA and mine owner approvals are planned to be completed by June 30, 1976; and field work is planned to start at the selected sites in July, 1976.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.) N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR W. Roger Hall	DATE 1-30-76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] ✓ [illegible] CONTRACT [illegible]	TYPE NO. 3	PROJECT OFFICER Hubbard ORGANIZATIONAL IDENTIFICATION EPA Washington D.C.		
FUNDS OBLIGATED 199,600	F.Y. 76	[illegible]	DATE PROJECT BEGAN 12/8/75	EXPECTED COMPLETION DATE 12/8/77

EPA Form 5700-1 (7-73)   REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
	PROJECT NO. (Do not use this space) SSIE
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	SSIE

TITLE OF PROJECT

"Coal Mine Haul Road Sediment Control Techniques"

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Principal Investigators - Wm. F. Grier and Carlos F. Miller; Mayes, Sudderth and Etheridge, Inc.

Project Manager - Danny A. McClain; DNREP-Kentucky

NAME AND ADDRESS OF APPLICANT INSTITUTION

Kentucky Department for Natural Resources and Environmental Protection
Frankfor, Kentucky 40601

SUMMARY OF PROPOSED WORK -- (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. [illegible] to the Smithsonian Science Information Exchange. Summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

This project will demonstrate the most effective methods of controlling the erosion which results when land is disturbed and altered by the construction of access roads to coal mining operations in the steeply sloping areas of Appalachia. The methods of controlling erosion on haul roads are techniques that can reasonably and economically be constructed by conventional equipment that is normally used or is available to coal operators. Remote instrumentation will collect water quality data for evaluation of the effectiveness of the erosion control methods.

The project will be located in Martin County on the Pevler operations site, which is part of the Island Creek Coal Company operation. The exact road will be determined from several which have been offered by Island Creek that best fits the need of this project and will be built in the time frame of this project.

SPECIFY PROFESSIONAL SCHOOL INVOLVED (e.g., Medical, etc.) N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by EPA Project Officer	DATE May 11, 1978

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SUPPORT OBTAINED FROM (check one) [illegible] X [illegible]	FILE NO. 68-01-04A-01	PROJECT OFFICER John F. Martin (513)-684-4417 RESPONSIBLE ORGANIZATION EPA, ORD, IERL-Cincinnati

FUNDS OBLIGATED 397 K	F.Y. 78	[illegible] 1	STARTING DATE 6/30/78	ESTIMATED COMPLETION DATE 7/30/79

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

SSIE NO.
UBU

TITLE OF PROJECT
"Environmental Impact of Steep Slope Mining"

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Ben E. Lusk, President
West Virginia Surface Mining and
Reclamation Association

NAME AND ADDRESS OF APPLICANT INSTITUTION
West Virginia Surface Mining and Reclamation Association
1624 Kanawha Boulevard, East
Charleston, West Virginia 25311

SUMMARY OF PROPOSED WORK — [illegible]

The primary objective of the project is to evaluate the effectiveness of the modified box-cut method of surface mining in reducing the impact on the surrounding environment.

The proposed work will be conducted at a working site on Trace Creek in Mingo Co., West Virginia, and will consist of the following tasks: (1) Determine environmental baseline parameters; (2) Documentation of mining operations (procedures); (3) Monitoring of environmental impacts during mining operations; (4) Acquire historical data on environmental impacts of other steep slope mining activities; (5) Document recovery of mined area; (6) Comparative analyses of various sites to the Trace Creek site; and (7) Preparation of progress and final reports.

SPECIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Elmore C. Grim	DATE 8/5/76

FOR OFFICE USE ONLY

[illegible]	[illegible] 05-01-05A-01	PROJECT OFFICER Elmore C. Grim (513) 684-4417 [illegible] EPA, [illegible]

[illegible] $10,000	F.Y. 76	[illegible] 0	STARTING DATE 9/1/76	ESTIMATED COMPLETION DATE 8/31/77

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT

Assessment of Fugitive Dust in Mining

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Robert Amick

NAME AND ADDRESS OF APPLICANT INSTITUTION

PEDCo Environmental
Suite 13 Atkinson Square
Cincinnati, Ohio 45246

SUMMARY OF PROPOSED WORK [illegible]

A major air pollutant from the extraction industries is particulate matter. All phases of mining, transportation and beneficiation tend to produce dust. This contract will study the dust generation potential of solid fuels and investigate current controls. The result will be an assessment report to delineate the problem, present the latest control technology, and recommend future research areas.

The report generated by this study will provide input to the interim manual of practice for surface mines. Work will also be related to western mining, and will provide information to the studies in that area.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared for the Principal Investigator by E. J. Hubbard	DATE 6/30/76

EPA OFFICE USE ONLY

[illegible]	TASK NO. 05-01-08A	PROJECT OFFICER E. Jo-Leen Hubbard RESPONSIBLE ORGANIZATION IERL-Ci, RSHD, EPB

[illegible] $1, 910	F.Y. 76	[illegible]	STARTING DATE 1/76	[illegible] 7/76

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT
Manual of Practice for Premining Planning Eastern Surface Coal Mining

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

R. V. Ramani	L. W. Saperstein
Associate Professor of Mining Engineering	Associate Professor of Mining Engineering
Department of Mineral Engineering	Department of Mineral Engineering
(see also attached sheet)	

NAME AND ADDRESS OF APPLICANT INSTITUTION
The Pennsylvania State University
University Park, PA 16802

SUMMARY OF PROPOSED WORK — [illegible]

The manual of practice will set out the rationale in pre-mining site evaluation so that mining and reclamation will be done in a manner so as to not only comply with existing and proposed state and federal mining programs but ensure minimal environmental damages. The site evaluation will include the evaluation of the soil and rock properties, surface and ground water resources, physical and cultural features, and methods of mining and reclamation. It will consider the geological and hydrological setting prior to mining as the basic inputs to the pre-mining planning. The manual of practice will provide guidelines and means of assessing alternatives in the areas of water management, land use planning, and surface mine engineering, and will be mostly based on information gained from literature review and critical evaluation of methods as reported in the literature and applied in the field. The M.O.P. shall recommend methods, techniques and alternatives for selecting and designing mining systems to achieve soil handling and storage, and overburden handling, segregation and disposal. It will be presented in an orderly and concise manner. Liberal use of charts, maps, graphs, diagrams and photographs will be made to substantiate the description.

The Manual of Practice (M.O.P.) will be designed to assist mine operators and control personnel in developing, evaluating and selecting mining and reclamation plans that will be least detrimental to the environment, prior to the commencement of mining.

[illegible] College of Earth and Mineral Sciences	[illegible] Proposed by Project Officer	DATE

EPA USE ONLY

[illegible]	TASK NO. 05-01-061-10	PROJECT OFFICER Elmore C. Grim (513-684-4417) [illegible] [illegible]

[illegible] 160,000	F.Y. 76	[illegible] 0	STARTING DATE July 1, 1976	[illegible] DATE June 30, 1977

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA 6983

TITLE OF PROJECT:

Evaluation of Groundwater Pollution from Eastern Underground Coal Mines

[illegible]

William E. Walker
Olin C. Braids
Dr. Lee V. Opperstein

NAME AND ADDRESS OF APPLICANT INSTITUTION

Geraghty & Miller, Inc.
44 Sintsink Drive East
Port Washington, New York 11050

[illegible]

Underground coal mines will disrupt the existing local hydrologic system and have the potential to pollute the groundwater in the vicinity of the mining operation. The rate, direction of movement, and dilution of the groundwater polluted by underground mining operations needs to be studied. The collection and analysis of available information from the literature, State and Federal agencies and industry concerning problems related to groundwater pollution from eastern underground coal mines.

Selection of nine mine sites where a detailed evaluation of groundwater pollution problems can be made. Determine necessary corrective action needed or being used and the improvement to groundwater quality that results from the corrective action.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/76

FOR OFFICE USE ONLY

[illegible]	[illegible] 05-02-03A-01	PROJECT OFFICER Thomas O. Navarre 684-4417 IERL Cincinnati, Ohio 45268

FUNDS [illegible] 133,000	F.Y. 76	[illegible] 1	STARTING DATE Oct. 1, 1976	EST. COMPLETION DATE April, 1978

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO.

CEC

TITLE OF PROJECT

"Effects of Surface Configuration in Water Pollution Control on Semi-arid Mined Lands"

Richard L. Hodder, Project Leader
I.B. Jensen, Principal Investigator

Montana State University
Bozeman, Montana 59715

SUMMARY OF PROPOSED WORK [illegible]

1. Objectives of this study are to demonstrate the effectiveness of several surface configurations in: controlling erosion, runoff, sedimentation and pollution of adjacent drainages; quickly producing a desirable stabilizing vegetative cover; creating an equilibrium between precipitation absorbed and soil moisture evaporated and transpired so that ground water pollution will remain minimal; producing an overall desirable reclamation design providing effective drainage, esthetics productiveness and use.
2. The approach will utilize five demonstration sites in Montana, North Dakota, and Wyoming. Each site will be subjected to several similar treatments and evaluated by use of complete monitoring systems.
3. Current plans require 40 A tracts of new spoils at each of the designated sites to be shaped, surface manipulation treatments applied and seeded to a broad mixture of native and introduced forage species.

Key Words: reclamation, erosion control, sedimentation, water pollution, revegetation, surface manipulation, infiltration, leachate, ground water, runoff, hydrology, watershed.

College of Agriculture	I. B. Jensen	May 6, 1975

FOR OFFICE USE ONLY

[illegible]	1-4-IA-1	Walter V. Grube, Jr. 304/276-5276 IERL, Cincinnati, Ohio 45268

$258,474	76	2	May 12, 1974	May 11, 1976

EPA Form [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

[illegible]

TITLE OF PROJECT
Environmental Monitoring & Assessment of Coal Strip Mining & Reclamation in the Four Cor

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS, PROJECT DIRECTORS AND ALL OTHERS PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT
[illegible] Resources, Dir., Assoc. Dean, College of Agric.
John L. Thames, Natural Resources, Prof. of Watershed Management.
Martin M. Fogel, Natural Resources, Prof. of Watershed Management.
Michael [illegible], Natural Resources, Asst. Prof. of Landscape Architecture
[illegible], Natural Resources, Research Associate

NAME AND ADDRESS OF SUPPORTING INSTITUTION
University of Arizona
Tucson, AZ 85721

SUMMARY OF PROPOSED WORK [illegible]

The overall objective of the project is to develop criteria for operational policy decisions for the management of land and natural resources as related to the mining industry and its place in the social, economic and natural environment of the arid and semi-arid Southwest. The criteria will be based on the assessment of methods for minimizing (1) erosion and sedimentation, (2) toxic mineral pollution of water resources and (3) air pollution, as well as for promoting post-mining reclamation that achieves optimum environmental stability.

The project involves field monitoring, laboratory analyses and computer synthesis of environmental parameters of the Peabody Coal Company strip mining operation on the Black Mesa of Arizona. Air quality, groundwater, and surface water as affected by mining will be studied. Alternative approaches to reclamation that will minimize environmental degradation and maximize human benefits will be studied and tested in the field.

Results of the study will be used to establish the present environmental effect of mining on the Black Mesa and the probable future effects of improved reclamation methods. Although the study will be confined to problems on the Black Mesa, results should be applicable to similar problem areas in the arid and semi-arid Southwest in preplanning mining operations and subsequent reclamation.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Renewable Natural Resources	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE May 18, 1976

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	ROAP 05-04-0?A-03	PROJECT OFFICER [illegible] (513) 684-4417 RESPONSIBLE ORGANIZATION ETD, IERL, [illegible]

FUNDS OBLIGATED 265,000	FY 76	NO. OF [illegible] 8	STARTING DATE 9/1/76	ESTIMATED COMPLETION DATE 10/31/77

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

ORD

TITLE OF PROJECT
Water Quality Hydrology of Surface-Mined Watersheds

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

David B. McWhorter - Principal Investigator
D.V. Sbogerboe - Professor
Student Help

NAME AND ADDRESS OF APPLICANT INSTITUTION

Colorado State University, Fort Collins, Colorado 80523

SUMMARY OF PROPOSED WORK - [illegible]

The specific objectives of the proposed project are:

(a) Test the single-equation model with data from as many locations as possible. This will be accomplished using data that have been or are currently being collected by industry and state and federal agencies on existing surface mines in the Rocky Mountain region.

(b) Document the basic data requirements and the procedures by which these data can be obtained.

(c) Prepare a set of charts and nomographs from which the values of all required model parameters can be determined from the basic field data and reclamation plan.

(d) Integrate the results of objectives a, b, and c into a manual of procedures for estimating the effect of surface mining on the quantity and quality of water resources in the mined watershed.

(e) Demonstrate the use of the manual using data contained in an actual environmental impact anlysis.

IF APPLICABLE, PROFESSIONAL SCHOOL INVOLVED Engineering and Natural Science	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared for Principal Investigator by Thomas O. Harpel, EPA	DATE 9/14/76

FOR OFFICE USE ONLY

[illegible] X	TASK NO. 05-01-03A-04	PROJECT OFFICER Thomas O. Harpel RESPONSIBLE ORGANIZATION IERL-Ci, REHD, STB

FUNDS ALLOCATED 30,366.00	F.Y. 76	[illegible] 1	STARTING DATE October 1, 1976	ESTIMATED COMPLETION DATE Sept. 30, 1978

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

GBO

TITLE OF PROJECT: Potential Impacts to Ground Water and Surface Water Quality & Quantity from Proposed Energy Development on the Northern Cheyenne Reservation, Montana

[illegible]

Richard Monteau, Director, Northern Cheyenne Research Project
Wm. W. Woessner, Hydrogeologist, Northern Cheyenne Research Project
Wm. E. Maxfield, Geologist, Northern Cheyenne Research Project
Bruce Ooms, Geologist, Northern Cheyenne Research Project

NAME AND ADDRESS OF APPLICANT INSTITUTION

Northern Cheyenne Tribe, Lame Deer, Montana 59043

[illegible]

The Northern Cheyenne Tribe, via the Northern Cheyenne Research Project, desired to develop an in-depth knowledge of the chemical and physical character of reservation water resources, and the interrelation of water to other resources, so that the tribe can make formal choices in planning coal development. A three-year study plan has begun to: (1) gather and interpret baseline data concerning the water resources and the interrelationships of these data to land, biocommunity, supply needs, and energy resources of the reservation; (2) ascertain potential adverse chemical, physical, and economic impacts to reservation water resources from coal development; and (3) develop a comprehensive water resources management plan that will aid present and future planning for resources exploitation. Standard field and laboratory methodology are being employed in assessing the geology, surface water, and ground water of reservation lands. Baseline discharge and water quality data collection has begun for 8 reservation streams. Well inventories, a basic ground water monitoring program, and collection of ground water quality data has begun. Stratigraphic correlation of the regional and local geology is being undertaken to establish potential development or priority areas. During the second budget period more detailed analyses of selected priority areas are planned.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	TASK NO. 5-4-3A-1	PROJECT OFFICER E. C. Grim 684-4417 [illegible] Cincinnati, Ohio 45268

[illegible] $201,000	F.Y. 76	[illegible]	STARTING DATE 5/75	[illegible] 5/76

EPA Form 5460-1 [illegible] REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	PROJECT NO. [illegible] [illegible]

TITLE OF PROJECT: "A Cooperative Program to Evaluate Surface and Ground Water Problems Associated with Potential Strip Mine Sites"

NAME, DEPARTMENT, AND INSTITUTION OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Theodore T. Williams, Montana State University
Robert H. [illegible], North Dakota State University
Paul A. Rechard, University of Wyoming

NAME AND ADDRESS OF APPLICANT INSTITUTION

Institute of Applied Research
Montana State University
Bozeman, Montana 59715

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress [illegible]

The major objective of this project is to identify possible impacts of coal mining and development in the Northern Great Plains on the surface and ground water systems of the surrounding area. Specific objectives are: (1) obtain an equation of balance for all water inflow and outflow in each of the three study sites, one each in Montana, North Dakota, and Wyoming; (2) characterize the overburden from a physical and chemical point of view as well as determine its relationship to the water coming to the surface; (3) characterize the chemical features of the mined sites; and (4) determine hydrologic character of spoils at active mine sites in Montana.

The work is a key effort in the EPA program to assess the surface and ground water problems associated with western coal.

Three sites are being studied. The first phase of this work is the collection of base line data before mining. Some data will be collected at two active mining sites in Montana to provide data for the analysis.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by T. G. [illegible]	DATE 9/16/75

FOR OFFICE USE ONLY

[illegible]	PROJECT NO. 05-04-04A-01	PROJECT OFFICER [illegible] RESPONSIBLE ORGANIZATION (513) [illegible] IERL - Cincinnati, Ohio 45268		
FUNDS $611,000	F.Y. 75	[illegible] 1	STARTING DATE June 30, 1975	ESTIMATED COMPLETION DATE June 29, 1976

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT:

Vegetative Stabilization of Spent Oil Shales

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

William A. Berg
Associate Professor of Agronomy (Soils)
Agronomy Department

NAME AND ADDRESS OF APPLICANT INSTITUTION

Colorado State University
Fort Collins, Colorado 80523

[illegible]

Objective: To investigate surface stability and salt movement in spent oil shales and soil-covered spent shales after a cover of native vegetation has been established by intensive treatments and then left under natural precipitation conditions.

Approach: The study is being carried out on two different spent oil shales. "Soil" treatments are plant establishment on: 1. directly on leached and fertilized spent shales; 2. six inches of soil over leached spent shale; 3. one foot of soil over unleached spent shale; 4. soil. Plots have been established on 25 percent north and south slopes at altitudes of 5700 and 7200 feet in or near the Piceance Basin of Northwestern Colorado. Each plot (16 per site) is bordered with wood to form individual runoff plots 11 feet wide and 35 feet long. Sediment and runoff catchments have yet to be installed. One site (5700') has been instrumented for soil salinity and soil moisture measurements.

A cover of native plant species has been established on the lower altitude site and will be established on the higher site. Measurements on vegetation include frequency, density and vegetative ground cover.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Agricultural Sciences	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by Eugene F. Harris	DATE 7-29-76

EPA OFFICE USE ONLY

☒ [illegible]	FILE NO. 05-03-01A-01	PROJECT OFFICER Eugene F. Harris RESPONSIBLE ORGANIZATION IERL-Cincinnati, Ohio

FUNDS OBLIGATED $21,055	F.Y. 76	[illegible]	STARTING DATE 9/1/76	ESTIMATED COMPLETION DATE 8/31/77

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

SSIE [illegible]

TITLE OF PROJECT

Environmental Assessment of Tar Sands Production & Processing

[illegible]

W. A. Frenter
D. W. Bicoune
V. E. Ballantye
R. J. Nancy

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF RESEARCH WORK [illegible]

If U. S. tar sands become a viable resource base for synthetic fuel, their commercial development would create activities and sources with potential for environmental impacts. Processing bitumen from the mined tar sand would generate solid waste sands while mining methods and associated impacts would be similar to coal operations. This study will investigate impacts to be expected from mining, processing and in situ utilization of tar deposits.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by John F. Martin	DATE 9/78

EPA OFFICE USE ONLY

[illegible]	[illegible] 05-05-02A-02	PROJECT OFFICER Eugene F. Harris 684-4417 RESPONSIBLE ORGANIZATION IERL Cincinnati, Ohio 45268

FUNDS OBLIGATED $ 57,000	F.Y. 78	[illegible] 0	STARTING DATE 1/78	ESTIMATED COMPLETION DATE 9/78

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

[illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

CBD

TITLE OF PROJECT

Environmental Impact of Coal Transportation

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Mike Szabo, Principal Investigator

NAME AND ADDRESS OF APPLICANT INSTITUTION

PEDCo Environmental
Suite 13, Atkinson Square
Cincinnati, Ohio 45246

SUMMARY OF PROPOSED WORK [illegible]

This project will compile data concerning the environmental aspects of coal transportation by truck, rail, barge, conveyor and pipeline. The study is to define problems and recommend future R & D efforts applicable to control technology for fuel transportation. The report will serve as a current State-of-the-Art for the transportation industry.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR **Prepared by John F. Martin**	DATE **9/76**

EPA GRANTS USE ONLY

[illegible]	FILE NO. **05-07-01A-01**	PROJECT OFFICER **John F. Martin 684-4417** RESPONSIBLE ORGANIZATION **IERL Cincinnati, Ohio 45268**

[illegible] **$68,701**	F.Y. **76**	[illegible] **0**	STARTING DATE **9/76**	EXPECTED COMPLETION DATE **9/76**

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0081

PROJECT NO. (DO NOT USE THIS SPACE)

(ORD)

TITLE OF PROJECT:

Development of A Streamlined Oil Retention Boom

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

R. L. Graegard - Vice President
Dr. Blair Folsom - Project Director

NAME AND ADDRESS OF APPLICANT INSTITUTION
Ultrasystems, Inc.
2400 Michelson Drive
Irvine, CA 92715

SUMMARY OF PROPOSED WORK – [illegible]

The contractor is designing and testing, in two phases, a large scale oil retention boom to operate in high currents. The streamlined boom concept was demonstrated in a Phase I effort. Currently in progress, Phase II is directed at: (1) developing a fundamental understanding of the oil-water flow in the vicinity of the bow wave that is formed in front of the boom at high current speeds and to design a proper bow shape to reduce oil-water mixing; (2) developing a functional oil separation system for handling the flow into the sump; (3) developing flotation and hydrodynamic control surfaces to facilitate effective operation of the boom in a wide range of wave and current conditions.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/8/76

FOR OFFICE USE ONLY

SUPPORT METHOD ☐ [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	TASK NO. 1 B	PROJECT OFFICER J. Stephen Dorrler [illegible] IERL-Ci, Edison, NJ

FUNDS OBLIGATED $35,000	F.Y. 76	[illegible] 1	STARTING DATE 6/76	ESTIMATED COMPLETION DATE 12/76

EPA Form [illegible] REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

ORD

TITLE OF PROJECT: Development and Demonstration of a Floating Oil Recovery System Utilizing Polyurethane Sorbent

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Sidney Shaw - Project Manager
Frank Marsh - V. Pres. for Engineering
Robert Beach - Project Engineer
Louis Brown - Manufacturing Manager
Harsh Gupta - Consultant - Morris Knowles Inc.
Eugene Miller, Jr. - Consultant - Hydronautics Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Seaward International Inc.
6367 Leesburg Pike
Falls Church, Virginia 22044

SUMMARY OF PROPOSED WORK [illegible]

The object of this contract is to design, fabricate and demonstrate a system for recovering oil from the surface of inland waters by means of polyurethane sorbent. The system is to be capable of collection rates of up to 11 cubic meters per hour from a 1.5 mm thick slick.

In the normal mode of operation, the system is mounted on the deck of a collection vessel. Uniform chips of sorbent foam are broadcast into the slick ahead of the collection vessel. After a short residence time, the oil laden sorbent is harvested by an inclined open wire mesh conveyor belt. The oil is removed from the sorbent by squeezing the foam in a regenerator-collector. The regenerated foam is then rebroadcast and the process proceeds on a continuous basis.

Testing of the completed system at the EPA OHMSETT facility in Leonardo, New Jersey took place in September 1975.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE
10/8/76

FOR OFFICE USE ONLY

SUPPORT CATEGORY [illegible]
X [illegible]

TASK NO.
1B

PROJECT OFFICER
J. Stanton Dorrler

OFFICER'S ORGANIZATION
SIHWRL-Ci, Edison, NJ

FUNDS [illegible]
$97,872

F.Y.
76

[illegible]
0

STARTING DATE
10/74

ESTIMATED COMPLETION DATE
11/76

EPA Form [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

SSIE

[illegible]

TITLE OF PROJECT

Protection and Restoration of Shorelines from Oil Spills

NAMES, DEPARTMENT, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this project are to provide for efficient action to minimize damage to shorelines from oil and hazardous substance discharges including containment, disposal and removal.

EPA headquarters has specifically expressed the need for, and given the highest priority to, Manuals of Practice (MOP) to meet the operational needs of field personnel during spill response actions to protect and restore threatened and contaminated shore areas. The projects associated with the milestone will satisfy the need by supplying Manuals of Practice which will be utilized by on-the-scene field personnel.

For the accomplishment of this milestone, the approach or methodology is to evaluate and select from the currently practiced state-of-the-art those field relevant methods and techniques for reduction to concise descriptive handbook format for on-the-scene use by field personnel.

The manuals will emphasize the decision process through which the field personnel must progress in order to arrive at the proper recommendation. For example, in protecting a marsh area, some questions that should be answered may include the type of marsh present, the inhabitants of the marsh, the time of year, expected weather conditions and the ecological, recreational, commercial and aesthetic value of the marsh.

Field procedures will be appended for utilizing existing products, equipment and supplies. These procedures will outline in concise descriptive format the step-by-step approach for implementation by the on-the-scene field personnel.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/6/76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible]	TASK NO. 1 R-D	PROJECT OFFICER J. Stephen Dorrler RESPONSIBLE ORGANIZATION IERL-Ci, Edison, NJ

FUNDS OBLIGATED $407,000	F.Y. 76	[illegible] 4	STARTING DATE 12/76	ESTIMATED COMPLETION DATE 12/78

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

EPA

ORD

TITLE OF PROJECT

Petroleum Pipeline Leak Detection

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK – [illegible]

This project is intended to define the state-of-the-art of pipeline leak detection and to develop an improved technique or set of techniques to advance this area of technology.

At present, a large percentage of inland oil spills are due to pipeline failures of various types. Additionally, with new portions of the outer continental shelf being developed for oil and gas resources, pipelines will be the principal means of moving the products to shore, and through various onshore facilities. The present state-of-the-art of pipeline leak detection permits sizeable quantities of material to flow from the pipe prior to shutdown. Therefore, it is necessary to attempt to advance the state-of-the-art of leak detection to minimize environmental impacts of leaking pipelines.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10/6/76

EPA OFFICE USE ONLY

SUPPORT METHOD [illegible]

X [illegible]

TASK NO. 1 D

PROJECT OFFICER J. Stephen Dorrler

ORGANIZATIONAL UNIT/LOCATION IERL-Ci, Edison, NJ

FUNDS OBLIGATED $80,000

F.Y. 76

[illegible] 2

STARTING DATE 10/76

ESTIMATED COMPLETION DATE 6/78

EPA Form 5760-1 (2-75) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. 158-R0081 PROJECT NO. [illegible] ROAP [illegible]

TITLE OF PROJECT

Manual of Practice for Oil Spill Dispersants and Surface Collection Agents

[illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK [illegible]

The objective is to develop a first generation manual of practice for environmentally acceptable utilization of oil spill dispersants to "prevent or substantially reduce explosion or fire hazard to property", or "prevent or reduce substantial hazard to a major segment of the populations of vulnerable species of waterfowl", or "result in least overall environmental damage, or interference with designated water use".

The approach utilized will be the reduction of the scientific and technical literature currently existing into a practical, utilization format which establishes guidelines and criteria to implement both the "spirit and letter" of Annex X (Schedule of Uses and Other [illegible] Chemicals and Other Additives to Remove Oil and Hazardous Substances Discharged) of the National Oil and Hazardous Substances Pollution Contingency Plan (FR, Vol. 40, No. 28, February 10, 1975). Additionally, an inventory of available equipment and agent application and use experts will be developed.

Numerous studies have documented the adverse toxicological properties of dispersants and oil alone, and in combination. As a result dispersants are not utilized in practice as an effective oil spill control and countermeasure option. Products, techniques and equipment for field use are available. What is needed is guidelines for their use in an environmentally acceptable manner. The decision making process to use or not to use dispersants is complex and involves practical compromises or trade offs between the several available options for cleanup and control. However dispersants do have their place in the arsenal of spill control options. The proper use of dispersants at the right time and place could significantly mitigate the adverse environmental effects of oil spills. This project will identify the proper use of dispersants, as well as field methods, equipment, techniques and application experts for their use in an environmentally acceptable manner. Additionally, dispersant product testing will be performed in order to develop [illegible] information.

[illegible]		10/6/76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 1 D	EPA TECH OFFICER J. Stephen Dorrler [illegible] IERL-Ci, Edison, NJ

FUNDS OBLIGATED $140,000	F.Y. 76	[illegible] 1	STARTING DATE 10/76	ESTIMATED COMPLETION DATE 10/77

EPA Form 5700 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

[illegible]

TITLE OF PROJECT

Air & Water Problems - Oil & Gas Production

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT LEADERS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

As an initial effort, assessments of the air and water pollution potential from increased offshore oil and gas production must be accomplished. Definition of the problem as it now exists will be of benefit in formulating future work plans. This contract for necessary services to study the pollution problems will result in the required problem definition.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE
10/6/75

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one)
AGENCY STAFF [illegible]
X NEGOTIATED CONTRACT
[illegible]

TASK NO.
4D

PROJECT OFFICER
Thomas [illegible]
[illegible]
IERL-Ci, Cincinnati, Ohio

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$18,000	76	0	10/75	6/76

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

ORD

TITLE OF PROJECT

Air Jet Boom for Inland Oil Spill Containment

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

The purpose of this project is to continue with the development of an air-operated spill control boom previously developed under R&D contract by Teledyne Corporation of Dallas, Texas. The boom has significant potential for use inland where debris and fast currents limit the applicability of conventional booms.

This project will be executed by means of an RFP written to enable a contractor to build a prototype boom to the specifications of performance that were developed under the previous project. It is expected that three projects will be required; one to fabricate the prototype, one to tank test the prototype at OHMSETT and provide related modifications, and a final project to field test the prototype.

Conventional booms obstruct the flow of water when used in fast-current situations and this obstruction leads [illegible]bulence and a bow wave around the boom. Oil which should be retained by [illegible] boom becomes entrained in this wave and passes under the boom. Additionally, with booms which obstruct surface flow, debris becomes entangled in the boom, making the oil-and-debris-removal problem quite complex. The proposed boom design overcomes both of these problems in that the oil is retained by an air flow, and no fixed object is in the water. Further, debris passes through the air current, and can be moved or not as circumstances dictate, downstream of the oil removal operation.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10/6/75

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one)
AGENCY STAFF (Intramural)
X NEGOTIATED CONTRACT
RESEARCH GRANT

TASK NO. 04-B-05A

PROJECT OFFICER John S. Farlow

ORGANIZATION/LOCATION IERL-Ci, Edison, NJ

FUNDS REQUESTED	F.Y.	NO. OF PROFESSIONAL MAN-YEARS	STARTING DATE	ESTIMATED COMPLETION DATE
$100,000	76	1	11/76	11/77

EPA Form 5700-1 (7-73) REPLACES SIE FORM 108 AND SIE 109 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved [illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. [illegible]

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

CED

TITLE OF PROJECT:
[illegible] AND DEMONSTRATION OF PROTOTYPE HAZARDOUS MATERIAL SPILL CONTROL DEVICES

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

M.L. SPROUL, MANAGER

NAME AND ADDRESS OF APPLICANT INSTITUTION

Mason & Hanger - Silas Mason Co., Inc.
P.O. Box 1316
Edison, N.J. 08817

SUMMARY OF PROPOSED WORK [illegible]

Establish and operate an Environmental Emergency Response Unit (EERU) to be located at the EPA facilities in Edison, New Jersey. The function of the Unit shall be for the operation of oil and hazardous material spill control prototype devices during actual spill situations; the shakedown, repair, modification and demonstration of the devices during periods when the equipment is not on spill call; and to establish and operate a set of pilot plants to be used for the determination of the best practicable application of the prototype equipment and other equipment and techniques for oil and hazardous materials under widely varying circumstances. The principle function of the pilot plants shall be to identify under controlled circumstances which devices or techniques are applicable to a given spill situation, and to establish the most practicable values of the operating parameters associated with complex spill control equipment.

SIGNATURE OF PRINCIPAL INVESTIGATOR: M. L. Sproul

DATE: July [illegible], 1975

FOR OFFICE USE ONLY

PROJECT OFFICER
Ira Wilder
[illegible]
OHMS Branch - IERL-Cincinnati

$232,000	76	1	STARTING DATE 6/75	ESTIMATED COMPLETION DATE 6/77

EPA Form [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)
SSIE
EPA
(CAN)

TITLE OF PROJECT: Mobile Field Use System for Detoxification/Incineration of Residuals from Oil & Hazardous Material Spills

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NAME AND ADDRESS OF APPLICANT INSTITUTION

Contract is Being Negotiated

SUMMARY OF PROPOSED WORK [illegible]

The objective is to design, construct, demonstrate, and evaluate an incineration/detoxification system--mounted on two semitrailers for portability--for the environmentally safe, continuous destruction of non-recoverable wastes accumulated during the on-site cleanup of oil and hazardous material spills. The materials requiring destruction will include hazardous materials, oils, processing residues, chlorinated hydrocarbons, pesticides, paint, oil-soaked materials, etc., all of which may have been mixed with the soil, cleanup agents, sands, water, debris, etc., that are co-collected during spill cleanup operations. The system shall be self-contained except for supplies of fuel and water, suitable for over-the-road hauling without special permits, and capable of being driven to and maintained at off-the-road sites. The system shall consist of: (1) a loading hopper and ram or similar feed for solids and semi-solids and a burner for pumpable liquids, (2) a rotary kiln that can be operated at about 1800 F if required, (3) an afterburner that can operate to approximately 2200 F with a nominal residence time of one second, (4) an ash quench/collection bin, (5) an air pollution control train capable of cooling the afterburner gas, removing particulates, and scrubbing toxic gases (HCl, SO_2, etc.) to the extent required by regulations and standards, (6) a forced draft stack, (7) on-board diesel electric power supply, and (8) all auxiliary equipment, tools, and short-life replacement parts, etc. The system shall handle at least 50 gpm of 10,000 BTU/lb liquids or 1000 lb/hr of equivalent solids. Particular attention must be paid to the installation and stability of refractories so that these can withstand transport. Appropriate instrumentation and controls are required. Ash, residues, and spent scrubbing liquid must be suitable for environmentally safe disposal.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (e.g., M.D., D.V.M., ETC.)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

EPA OFFICE USE ONLY

SUPPORT METHOD (check one)
[illegible]
X [illegible]

ROAP NO.
03-01-03A
08-04-03A

PROJECT OFFICER
John E. Brugger
RESPONSIBLE ORGANIZATION
OHMS Branch - IERL-Cincinnati

FUNDS OBLIGATED	F.Y.	NO. OF YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$961,000	76	3	10/76	6/78

EPA Form 5700-1 (2-73) REPLACES PHS FORM 166 AND SIE-6 FOR EPA WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0061

PROJECT NO. (Do not use this space)

ORD

TITLE OF PROJECT: Evaluation of Selected Surface Treatment Agents for the Protection and Restoration of Shorelines and Salt Marsh Areas

NAMES, DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Thomas Kenney - Project Director
Forrest Smith - API Program Director
James Sartor - Woodward Clyde Consultants

NAME AND ADDRESS OF APPLICANT INSTITUTION:

American Petroleum Institute
2101 L Street, N.W.
Washington, D.C. 20037

SUMMARY OF PROPOSED WORK

The objective of this project is to conduct full-scale, "real world", tests on the effectiveness of six treatment agents in protecting shorelines from nearshore oil spill contamination. The selected agents are those recommended by four laboratory-scale projects previously funded by API. The project will be conducted in two phases.

Phase I consists of a six task program to evaluate the ability of: water glass, Polyco 460 (polyvinyl acetate), Oil Herder, citrus pectin, *Micrococcus cerificans*, and Biopolymer 5700, as shoreline protection agents. The first three tasks, which involve obtaining permits from Federal, State and local authorities for field test sites on the East and West coasts and review of prior research to define criteria and techniques for full-scale field tests, have been funded separately by API.

The other tasks to be undertaken in Phase I are preliminary agent evaluation tests, full-scale evaluation at the Sewaren Peninsula, Woodbridge, New Jersey, field test site, and final report preparation.

Phase II consists of evaluating additional products recently brought to the attention of API and EPA by manufacturers. Additionally, new methods and techniques on shoreline protection measures may be considered for field evaluation.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/6/76

FOR OFFICE USE ONLY

☐ ☐ ☐ ☒	TASK NO. 04-03-03A	PROJECT OFFICER Leo T. McCarthy RESPONSIBLE ORGANIZATION IERL-Ci, Edison, NJ

FUNDS OBLIGATED	F.Y.		STARTING DATE	ESTIMATED COMPLETION DATE
$75,000	76	2	6/76	6/78

EPA Form 5700-1 (7-73) REPLACES EPA FORM 100 AND R-115 (SS) WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

(EPA)

TITLE OF PROJECT

Workshops for Planners - Onshore Support of OCS Oil & Gas

[illegible]

William W. Doyel, U.S. Geological Survey, Resource & Land Investigations Program
(Assistant Manager for Information Dissemination)
Philip A Marcus, U.S. Geological Survey, Resource & Land Investigations Program
(Environmental Planner)

NAME AND ADDRESS OF [illegible] INSTITUTION

Resource & Land Investigations Program
U.S. Geological Survey (MS 750)
Reston, Virginia 22092

[illegible]

Objective: To carry out a series of workshops for State and local planning officials to provide them with methodologies and information pertaining to the identification of the onshore impact of outer continental shelf petroleum development and the siting of facilities associated with that development.

Approach: Retain the American Society of Planning Officials (ASPO) to set up the meetings, arrange for curricula and facility, prepare preprints and proceedings, and present a final report both on the content and on the success of this means of rapid dissemination of information.

Use the results of USGS-funded [illegible] New England River Basins Commission (NERBC) methodology and development for the New England OCS frontier as a basis for the first series of workshops (held in 3 locations around the coastal U.S.).

Involve State and local planners from the region where each workshop is held to the maximum extent possible in preparation and in execution to enrich the total content, to ensure useful feedback to NERBC, and to guarantee a nationally useful body of information and methods.

Progress: IAG with USGS signed; ASPO contract signed; Federal and regional advisory committees being formed; first workshops tentatively scheduled for January 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/6/76

EPA OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] [illegible] [illegible]	TASK NO. 04-04-04A	PROJECT OFFICER John B. Farlow [illegible] IERL-Ci, Edison, NJ

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$300,000	76	3	6/76	6/78

EPA Form [illegible] REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

[illegible]
CSP

TITLE OF PROJECT

Policy Analysis for Hazardous Waste Control

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Graham C. Taylor; Research Economist, Colorado School of Mines
Larry MacDonnell; Assistant Professor, Mineral Economics Dept., Colorado School of Mines

NAME AND ADDRESS OF APPLICANT INSTITUTION

Colorado School of Mines
Golden, CO 80401

SUMMARY OF PROPOSED WORK [illegible]

(1) Objectives are to (a) develop a "framework" for the systematic analysis in the socioeconomic context of policies to control hazardous wastes, (b) to make a generalized analysis of the majority of existing and potential policies for hazardous waste control, and to array these policies so that the different impacts and trade-offs between alternative policies are demonstrated.

(2) Approach will be to identify the "parties-at-interest" and the nature of the impacts to which they are subjected, together with their possible responses. This will lead to generalized policy analysis using benefit/cost analysis techniques for quantifiable elements. Impacts of each policy-waste combination will be compared. The approach will be demonstrated by the use of one or two case studies in which the analysis is pursued in greater detail.

(3) The one-year project is expected to commence in summer of 1976.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)
Mineral Economics Department

SIGNATURE OF PRINCIPAL INVESTIGATOR
G. C. Taylor

DATE
5/21/76

EPA OFFICE USE ONLY

[illegible]

PROJECT OFFICER
John E. [illegible]

EPA, IERL, Cincinnati, OH 45268

FUNDS OBLIGATED
44,824

F.Y.
76

STARTING DATE
7/16/76

EXPECTED COMPLETION DATE
9/1/77

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. GOVERNMENT PRINTING OFFICE [illegible]

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE [illegible] INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. [illegible] [illegible]

TITLE OF PROJECT Control of Radiological Impacts From Recovery of Uranium From Phosphate Ores, Products, By-products and Wastes

[illegible]

Principal Investigator ○ Phil Walsh
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

NAME AND ADDRESS OF APPLICANT INSTITUTION
Energy Research and Development Administration
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

SUMMARY OF PROPOSED WORK [illegible]

Existing and innovative technologies that recover uranium from phosphate ores, products, by-products, and wastes will be studied to determine their radiological impacts. Effluent, emission, and solid waste control technologies applicable to uranium recovery from phosphates will be investigated. Qualitative and quantitative estimates of the efficacy of both the recovery of uranium and the control of other radionuclides from entering the environment will be made for each of the recovery technologies investigated and the emission and effluent control technologies studied. A summary of possible recovery and control technologies will be included. Cost estimates will be made for each technology examined. The reduction in annual population dose resulting from uranium recovery and radiation control will be determined for each recovery technology examined.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]	[illegible]	PROJECT OFFICER Joseph Fitzgerald [illegible] Criteria & Standards Division, ORP, OAWM Environmental Protection Agency

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$125,000	76			
75,000	77	FY 77	August 1976	December 1977

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0061

PROJECT NO. [illegible]

CIMP

TITLE OF PROJECT

"Vegetative Stabilization of Paraho Spent Oil Shale"

NAME (FIRST, INITIAL, LAST), DEPARTMENT, AND OFFICIAL TITLE(S) OF PRINCIPAL INVESTIGATOR(S) OR PROJECT DIRECTOR(S) AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

William A. Berg
Associate Professor of Agronomy
Department of Agronomy
Colorado State University Ft. Collins, Colorado 80521

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK [illegible]

The objective of this research project is to study surface stability and water movement in and through the Paraho spent oil shales. In addition to the vegetative stabilization studies, the distributions of water and salts in the plots will be monitored with the objective of quantifying the potential salt pollution from shale residues. It is not possible to experimentally model the actual prototype disposal. For this reason, data from plot studies will be used to develop and verify a mathematical model of salt and water transport. This model will be used to estimate the long term water quality and quantity aspects of large scale disposal of spent shale residues.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Agricultural Sciences	SIGNATURE OF PRINCIPAL INVESTIGATOR Prepared by: [illegible] F. Harris for the Investigator	DATE 8/27/76

FOR OFFICE USE ONLY

SUPPORT [illegible]	FORM NO. 03-03-05A-01	PROJECT OFFICER Eugene F. Harris 513-684-4417 RESPONSIBLE ORGANIZATION IERL-Cincinnati
GRANT [illegible] 803801	F.Y. 76	[illegible]
STARTING DATE 9/15/76	ESTIMATED COMPLETION DATE 9/14/77	

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

SSIE
CEP

TITLE OF PROJECT
"Water Quality Hydrology Affected by Oil Shale Development"

NAMES, DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. David B. McWhorter, Assistant Professor, Principal Investigator
Dr. Robert C. Ward, Assistant Professor
Mr. Gaylord V. Skogerboe

NAME AND ADDRESS OF APPLICANT INSTITUTION

Colorado State University
Agricultural Engineering Department
Fort Collins, Colorado 80523

SUMMARY OF PROPOSED WORK [illegible]

Oil shale deposits in the Upper Colorado River Basin are located in the states of Colorado, Wyoming, and Utah. The large fraction of potential commercial deposits are contained in the Green River formation in the Piceance Basin of Colorado, however. The Green River formation is an Early Tertiary geologic unit, formed in a depositional basin during Eocene time. Topographic and structural highs surround the Piceance Basin on the South, East, and West sides. Both surface and subsurface drainage are toward the North, to the White River. The White River is tributary to the Colorado.

The specific objectives of the proposed project are:

A) To gather all available data pertinent to the present and future assessment of the water quality hydrology in the oil shale regions of the Upper Basin. These data will be sought from universities, Federal and state agencies, and private companies.
B) To summarize and analyze these data toward the identification of data deficiencies, needs for additional data, and procedures for the assessment of the impact on water quality hydrology.
C) To develop procedures for the quantitative assessment of the quantity and quality of surface and subsurface runoff from processed shale residue and mine spoils, and to verify these procedures on a field site.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)
Agricultural Engineering

SIGNATURE OF PRINCIPAL INVESTIGATOR
Prepared for the Principal Investigator by Eugene F. Harris

DATE
July 22, 1976

EPA OFFICE USE ONLY

SUPPORT ACTION (Check one)
[illegible]
[illegible]
[illegible]
X [illegible]

FILE NO.
05-05-03A-01

PROJECT OFFICER
Eugene F. Harris (513)-684-4417

RESPONSIBLE ORGANIZATION
IERL-Cincinnati, Ohio

FUNDS OBLIGATED
$80,000

F.Y.
76

NO. OF PERSON-YEARS [illegible]
0

STARTING DATE
6/15/76

ESTIMATED COMPLETION DATE
6/14/77

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

SIE

EPA

TITLE OF PROJECT

Assessment of Environmental Aspects of Uranium Mining and Milling

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

A. K. Reed, H. C. Meeks, S. E. Pomeroy, and V. Q. Hale, Minerals and Metallurgical Processing Section

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle, Columbus Laboratories, Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

The objective of this investigation is to perform a preliminary study to determine the potential environmental impact of the recovery of uranium from domestic uranium ores. To satisfy this objective, the contractor will perform the following subtasks with emphasis on the potential environmental problems in each subtask. All forms of pollution except radiation will be considered.

(1) Location of domestic deposits
(2) Uranium mining methods
(3) Ore handling and transportation
(4) Processing
(5) Flow Diagrams
(6) Refuse Disposal

SCIENTIFIC PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR: Elmore Grim

DATE: 6/28/76

FOR AGENCY USE ONLY

☒ [illegible]

[illegible] NO.: 5-6-IA-1

PROJECT OFFICER
Elmore C. Grim
[illegible]
IERL-Cincinnati, Ohio 45268

F.Y.: 76

STARTING DATE

ESTIMATED COMPLETION DATE: 10/28/76

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

"Environmental & Pollution Aspects of Coal Slurry Pipelines"

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Robert R. Faddick, Associate Professor of Basic Engineering

NAME AND ADDRESS OF APPLICANT INSTITUTION

Office of Research Services, Colorado School of Mines, Golden, Co. 80401

SUMMARY OF PROPOSED WORK [illegible]

With the anticipated increases in coal consumption in the next decade, greater demands will be made on existing transportation systems to move to market the abundant reserves of coal in the U.S. Conventional transportation modes such as rail and barge will have to expand their capabilities by overcoming whatever shortages may exist in manpower, capital, and hardware. Simultaneously, lesser known systems such as coal in water (slurry) pipelines will have to share the transportation load. With some half-dozen coal slurry pipelines being considered for construction within the next five years, pending eminent domain legislation, it will be a matter of time before these lines are built.

A coal slurry pipeline system may impact the environment at three stages: design, construction, operation and maintenance; and in three areas: slurry preparation, slurry pipeline, and slurry separation.

It is proposed to study the environmental and pollution aspects of coal slurry pipelines. This work would enhance the selection of better design, construction, and operation techniques to provide a balance of engineering economics, and environmental considerations.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

[illegible]

[illegible]	[illegible]	PROJECT OFFICER John E. Martin 513-684-4417 [illegible] [illegible] IERL Cincinnati
[illegible]	9-7-15-2	

[illegible]	[illegible]	[illegible]	STARTING DATE	[illegible]
$44,994	76	[illegible]	6/30/76	[illegible]

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE

TITLE OF PROJECT

Environmental Impact of Oil Shale Development

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. L. G. Neal - TRW
Dr. J. Cotter - TRW
Dr. C. Prien - DRI

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRW - Redondo Beach California
Denver Research Institute, Denver, Colorado

SUMMARY OF PROPOSED WORK [illegible]

The major objectives of this project include the acquisition of the necessary background data on the principal industrial shale recovery processes and U. S. shale resources, a comparative assessment of their environmental acceptability and an evaluation of technologies available for the control of air, water, and solid waste emissions.

Shale oil production requires cheap, large-scale materials handling methods at all stages of mining, retorting, and retorted shale disposal; maximum heat economy in retorting and upgrading; and minimum water and power consumption. A number of processing sequences are available, each with its own accompanying environmental impacts.

The evaluation and assessment program involves six tasks:

(1) Project Management
(2) Oil Shale and Recovery Process Characterization
(3) Engineering Analysis and Problem Definition
(4) Field Testing and Laboratory Analysis
(5) Environmental Evaluation
(6) Evaluation of Existing Environmental Control Technology

This project will provide a basis for the establishment of rational design, management, and monitoring procedures to mitigate unavoidable adverse environmental impacts. The type and magnitude of these impacts should be determined prior to the development of a full-scale oil shale industry.

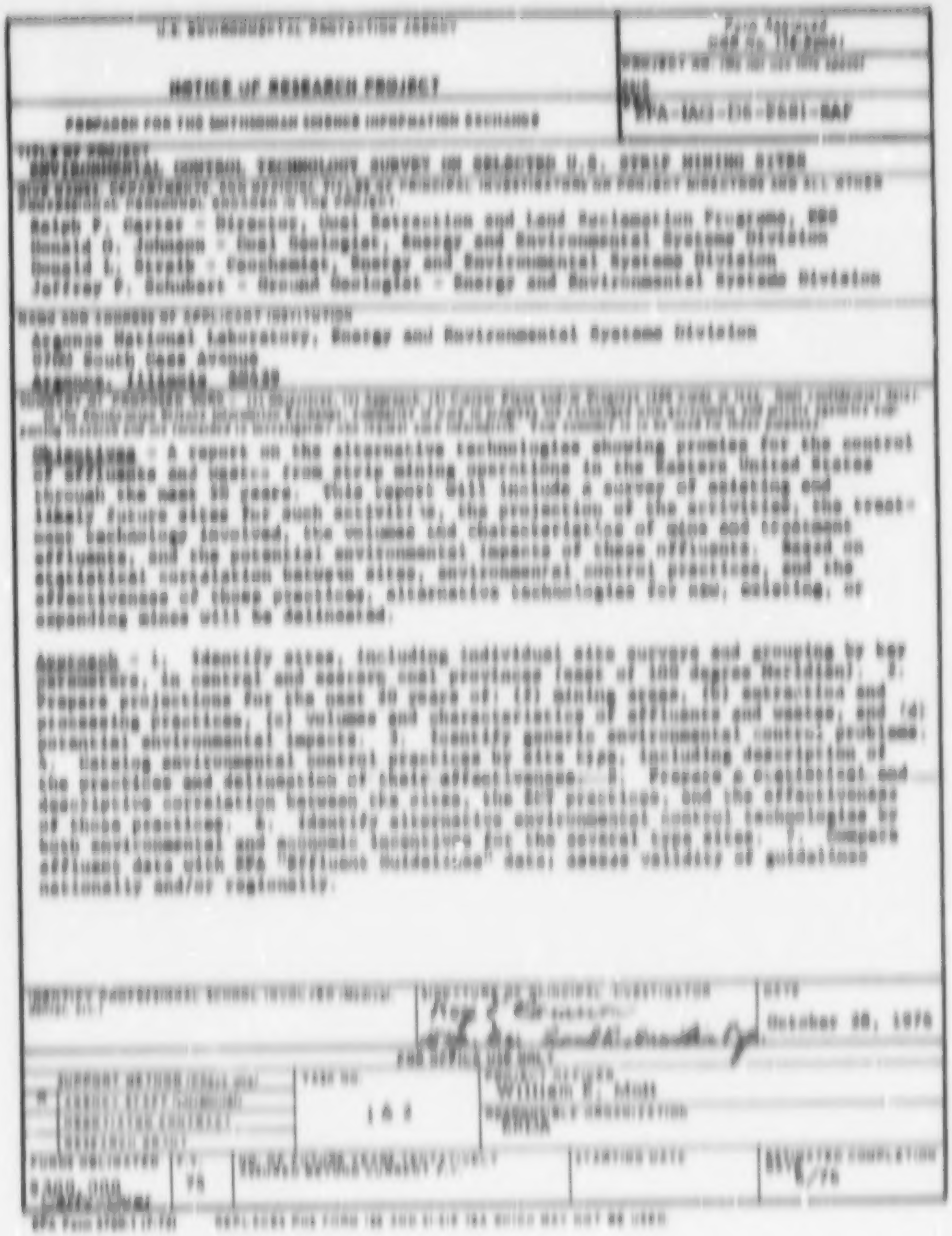
IDENTIFY PROFESSIONAL SCHOOL INVOLVED (if any)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
		10-7-76

FOR EPA USE ONLY

SUPPORT CATEGORY	ROAP NO.	PROJECT OFFICER
X [illegible]	05-01-01A	Thomas Powers IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$550,000 $413,000	75 76	0	5/75	5/78

EPA Form 5700-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.



U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

EPA-IAG-D6-E681-BAF

TITLE OF PROJECT:
ENVIRONMENTAL CONTROL TECHNOLOGY SURVEY OF SELECTED U.S. STRIP MINING SITES

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Ralph P. Carter - Director, Coal Extraction and Land Reclamation Programs, EES
Donald O. Johnson - Coal Geologist, Energy and Environmental Systems Division
Donald L. Streib - Geochemist, Energy and Environmental Systems Division
Jeffrey P. Schubert - Ground Geologist - Energy and Environmental Systems Division

NAME AND ADDRESS OF APPLICANT INSTITUTION

Argonne National Laboratory, Energy and Environmental Systems Division
9700 South Cass Avenue
Argonne, Illinois 60439

SUMMARY OF PROPOSED WORK [illegible]

Objectives - A report on the alternative technologies showing promise for the control of effluents and wastes from strip mining operations in the Eastern United States through the next 10 years. This report will include a survey of existing and likely future sites for such activities, the projection of the activities, the treatment technology involved, the volumes and characteristics of mine and treatment effluents, and the potential environmental impacts of these effluents. Based on statistical correlation between sites, environmental control practices, and the effectiveness of these practices, alternative technologies for new, existing, or expanding mines will be delineated.

Approach - 1. Identify sites, including individual site surveys and grouping by key parameters, in central and eastern coal provinces (east of 100 degree Meridian). 2. Prepare projections for the next 10 years of: (a) mining areas, (b) extraction and processing practices, (c) volumes and characteristics of effluents and wastes, and (d) potential environmental impacts. 3. Identify generic environmental control problems. 4. Catalog environmental control practices by site type, including description of the practices and delineation of their effectiveness. 5. Prepare a statistical and descriptive correlation between the sites, the ECT practices, and the effectiveness of those practices. 6. Identify alternative environmental control technologies by both environmental and economic incentives for the several type sites. 7. Compare effluent data with EPA "Effluent Guidelines" data; assess validity of guidelines nationally and/or regionally.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (medical, dental, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
	Ralph P. Carter	October 28, 1975

EPA OFFICE USE ONLY

SUPPORT METHOD (Check one)	TASK NO.	PROJECT OFFICER
☒ AGENCY STAFF (In-house) ☐ [illegible] ☐ [illegible] ☐ [illegible]	1 & 2	William F. Holt RESPONSIBLE ORGANIZATION [illegible]

FUNDS OBLIGATED	F.Y.	NO. OF FOLLOW YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$400,000	76			6/76

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Page 1 of 2

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (DO NOT USE THIS SPACE) SSIE EPA EPA-IAG-D6-E-681-BAF

TITLE OF PROJECT:
LAND RECLAMATION PROGRAM

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Ralph P. Carter - Director, Land Reclamation Program
Roy O. Cameron - Deputy Director, Land Reclamation Program

NAME AND ADDRESS OF APPLICANT INSTITUTION
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

SUMMARY OF PROPOSED WORK [illegible]

Objectives - The Land Reclamation Laboratory has been formed to address the need for coordinated basic and applied research into the geophysical, geochemical, biological, ecological, aquatic, and soil phenomena of mined land reclamation, especially relative to cost-effective techniques for rehabilitating coal mined land. Near- and long-term efforts are focused in the major U.S. coal resource regions where results will be evaluated, disseminated, and coordinated with related studies of industry, academic, and government agencies.

Approach - The Program is being conducted by interdisciplinary teams of scientists and engineers to develop, test, evaluate, and assess field and laboratory surveillance methods and monitoring systems for pre-, operational, and post-operational reclamation activities associated with coal mining operations. The Program includes tasks of data acquisition systems, geoscientific and ecological analysis methodology, techniques for integrated and automated mine site monitoring systems, and ecosystem model development.

Current Activities - A. Many of the factors that determine reclamation practices and subsequent success are region- or site-specific. Field sites therefore have been presently selected at mines in six of eight physiographic regions. These have been selected to typify the region's reclamation problems, ranging from the Mountain and Southwest to Eastern and Interior Regions. At each site, specific problems are being studied in cooperation with the mining company, and assisted by academic personnel. Impacts of mining on aquatic, hydrological, soil, geophysical, and geochemical systems are being studied. Terrestrial ecosystem research is centered on restoration of vegetation.

B. Model development is being undertaken for aquatic and terrestrial ecosystems to predict environmental changes both from mining and as a result of selected reclamation technologies. The models will rely heavily on data validated

IDENTIFY PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR R. P. Carter Director, Land Reclamation Program	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☒ [illegible] ☐ [illegible] ☐ [illegible] ☐ [illegible]	[illegible] NO.	PROJECT OFFICER William V. Mott RESPONSIBLE ORGANIZATION ERDA

FUNDS OBLIGATED [illegible]	F.Y. 75	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

EPA Form 5700-1 (2-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

LAND RECLAMATION PROGRAM

Current Activities (Contd.)

from on-site studies.

C. Both land reclamation data acquisition and management systems, and a comprehensive, computerized bibliographic reference library are being developed. These will allow effective dissemination of information acquired through the activities of the Land Reclamation Program and related studies, thus providing an information base that will be useful in the selection of cost-effective reclamation programs and policies.

U.S. GOVERNMENT PRINTING OFFICE 1978-[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

EPA-IAG-D5-E681-AAO

TITLE OF PROJECT: EVALUATION OF VARIOUS METHODS, TECHNIQUES AND MATERIALS FOR [illegible]

[illegible] PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Vern C. Rogers, Manager, Nuclear and Advanced Systems Department
Paul J. Macbeth, Nuclear Engineer, Nuclear and Advanced Systems Dept.
Craig Jensen, Nuclear Engineer, Nuclear and Advanced Systems Dept.

NAME AND ADDRESS OF APPLICANT INSTITUTION

FORD, BACON & DAVIS UTAH INC.
375 CHIPETA WAY - P. O. BOX 8009
SALT LAKE CITY, UTAH 84108

(801) 583-3773

SUMMARY OF PROPOSED WORK [illegible]

The objectives of the work are:

(1) to experimentally determine the characteristics of radon migration in the ground

(2) measure emanating powers

(3) investigate attenuation through thick cover material

(4) investigate properties of chemical and vegetative stabilization

(5) establish criteria and standards for stabilization

The project approach is experimental using measurements of radon surface flux and radon concentration in soil gas.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 11-8-78

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☒ [illegible] CONTRACT ☐ [illegible]	TASK NO. 1	[illegible] [illegible] Kennedy RESPONSIBLE ORGANIZATION ERDA

FUNDS OBLIGATED	F.Y. 78	[illegible]	STARTING DATE 1975	ESTIMATED COMPLETION DATE 1979

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U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA-IAG-[illegible]

TITLE OF PROJECT: Use of Asphalt Emulsion - Soil Layers in Containment of Radon and Radium from Uranium Ore Tailings

NAMES, DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

J. N. Hartley, Program Manager, Chemical Technology Department
P. L. Koehmstedt, Principal Investigator, Senior Research Scientist, Materials Dept.
[illegible], Research Scientist, Water and Land Resources Department
[illegible] Davis, Research Engineer, Chemical Technology Department

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Memorial Institute, Pacific Northwest Laboratories
P.O. Box 999
Richland, WA 99352

SUMMARY OF PROPOSED WORK [illegible]

A long-term stable diffusion barrier is needed: 1) to retain radium-226 with a half-life of 1620 years in uranium tailings dumps for thousands of years, and 2) to contain Radon 222, a gas with a relatively short half life of 3.8 days. Asphalt-soil emulsions are proposed as an economical material to contain radium in the tailings pile and to provide a barrier to radon diffusion. The objective of this work is to formulate suitable asphalt emulsions, measurement of radioisotope diffusion through such emulsions, and assessments of radiation and oxidation damage to asphalt emulsions.

Preliminary results of laboratory experiments using samples of uranium tailings and a radon generator indicate no diffusion of radon through asphalt-soil emulsion that are as thin as 1/16 inch. Further tests are being conducted on a variety of tailings samples. No data are yet available on radium diffusion tests.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10-13-76

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TASK NO. 162

PROJECT OFFICER Richard D. Kennedy

ORGANIZATIONAL UNIT [illegible]

Funds Estimated*: $[illegible] — FY 76

STARTING DATE 6/76

ESTIMATED COMPLETION [illegible]

*Funds approximate not for citation. [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE

EPA-IAG-D5-E681-BAG

TITLE OF PROJECT

Uranium Mining and Milling Environmental Assessment

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Western Interstate Nuclear Board
Lakewood, Colorado

SUMMARY OF PROPOSED WORK [illegible]

The uranium cycle will be assessed for air, water, solid waste, and radiological impacts. A planning and technical document will be developed to guide administrators in their decisions. This siting guide will address planning and regulatory procedures applicable to mill siting. A succinct review of options for uranium extraction (leaching and solution mining) will also be performed.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ● [illegible] [illegible] [illegible]	TASK NO.	PROJECT OFFICER Richard H. Kennedy SPONSORING ORGANIZATION ERDA

FUNDS OBLIGATED FY [illegible] 76	[illegible]	STARTING DATE 1975	ESTIMATED COMPLETION DATE 1976

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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Form Approved

OMB No. 158-R0042

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

EPA-IAG-D5-E763 76 BBF

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT: Technologies for controlling adverse effects of mining on forest, range, and related ecosystems.

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT: Coordinated studies by Forest Service research scientists underway at several locations in the West, Northern Great Plains, Southwest, and East being conducted by: Director, Rocky Mountain Forest and Range Experiment Station, 240 West Prospect Street, Fort Collins, Colorado 80521, (303) 484-6570;

(continue on attached sheet)

NAME AND ADDRESS OF APPLICANT INSTITUTION

U.S. Department of Agriculture

14th and Independence Ave., S.W.

Washington, D.C. 20250

SUMMARY OF PROPOSED WORK [illegible]

1. Develop guidelines and criteria for overburden drilling, analysis, and placement as related to growth supporting media;

2. Prepare technical handbook on vegetation methods for mined lands in Eastern U.S., including recommendations for new research;

3. Develop guidelines and criteria for the use of non-mine wastes as soil amendments on coal and oil shale spoils;

4. Develop recommendations, guidelines, and criteria, based on new research, for revegetation following coal and oil shale mining.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED: NA

SIGNATURE OF PRINCIPAL INVESTIGATOR:

DATE: 9-13-76

FOR OFFICE USE ONLY

SUPPORT METHOD (check one)

☒ INTERAGENCY AGREEMENT

☐ GRANT

☐ CONTRACT

☐ IN-HOUSE

TASK NO.: 1-6

PROJECT OFFICER: R. E. Callahan

ORGANIZATIONAL LOCATION: Forest Environment Research, Forest Service, USDA

FUNDS OBLIGATED: $539,000

FY: 76

NO. OF YEARS: Three

STARTING DATE: 1975

ESTIMATED COMPLETION DATE: 1979

EPA Form 5100-1 (7-73) REPLACES PHS FORM WHICH MAY NOT BE USED

Addition from Page 1

Give Names, Departments and Official Titles of Principal Investigators or Project Directors and all other Professional Personnel Engaged in the Project.

Director, Intermountain Forest and Range Experiment Station, 507 25th Street, Ogden, Utah 84401, (801) 399-6361; Director, Forest Environment Research Staff, 12th & Independence Ave., S.W., Washington, D.C. 20250, (703) 235-1071; and Director, Northeastern Forest and Range Experiment Station, 6816 Market Street, Upper Darby, Pennsylvania 19082, (215) 597-3715.

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

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PROJECT NO. [illegible]

SSIE

EPA-IAG-D6-E764-BBF

TITLE OF PROJECT

Development of Soil Loss Evaluation Guidelines for Western US Lands Disturbed by Mining

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

PI: [illegible].D. Murdick : State Conservationist
PI: T. J. Holder : Soil Scientist (Project Supervisor)

NAME AND ADDRESS OF APPLICANT INSTITUTION

U.S.D.A. - Soil Conservation Service, Colorado State Office
P.O. Box 17107
Denver, Colorado 80217

SUMMARY OF PROPOSED WORK — [illegible]

The purpose of this effort is to develop guidelines which can be utilized to estimate soil losses resulting from land disturbances caused by mining activities in North Dakota, South Dakota, Wyoming, Montana, Colorado, Utah, New Mexico, and Arizona. Guideline development will consist of compilation of pertinent data with respect to soil properties, climatic factors, vegetative influences, and topographic variables in areas where the potential is high for the mining of Western energy resources. An approach to estimate soil losses on disturbed land due to mining activities will be developed. Soil erosion control and conservation practices utilized on Western lands disturbed by mining will be identified and evaluated. Using collected data, the developed soil loss estimation approach, and existing mined land reclamation requirements for the Western states, general soil loss potentials will be derived.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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SUPPORT METHOD (Check one)
[illegible]
[illegible]
X [illegible]

TASK NO.
4

PROJECT OFFICER
W. E. Brown

RESPONSIBLE ORGANIZATION
USDA, Forest Service

Funds Estimate* 280,000

F.Y. 76

[illegible]

STARTING DATE
1975

ESTIMATED COMPLETION DATE
June 1980

*Funds approximate not for citation [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved

SSIE

EPA-IAG-D6-E763-[illegible]

TITLE OF PROJECT:

Reclamation Potential & Reclamation Inventory for Western U.S. Surface Coal Mining Activities.

Ed L. Noble
Paul Packer
Dr. Homer Ray

NAME AND ADDRESS OF APPLICANT INSTITUTION

U.S. Dept of Agriculture, Intermountain Forest & Range Experiment Station
860 North 12th Street
Logan, Utah 84321

SUMMARY OF PROPOSED WORK

The proposed effort is required to properly assess th: technology available to adequately reclaim and revegetate lands disturbed during the surface mining of coal in the interior western United States. It is also necessary to accurately project the reclamation potential for lands that may be disturbed. It will be necessary to inventory the existing quantitative reclamation experiments as well as the ongoing full-scale reclamation projects to provide a common data base from which the assessment can be made. Some additional measurements of revegetation success will be designed. Field inspections of all mines and off-site reclamation efforts are necessary. Principal investigators will be consulted as will mine operators. Key reclamation variables will be identified and described for each activity. The results of ongoing reclamation activities will be examined to determine their applicability to other areas. The measures of reclamation success will be articulated. Criteria to determine when and where reclamation is attainable and assured will be described and research to fill these gaps will be developed.

In order to properly compare geographical areas with respect to their reclamation potential after land have been mined or otherwise disturbed by development of th: coal resource, a map-assisted comparison (of reclamation potentials) will be produced for the interior western United States. The relative assessmentsof rehabilitation potentials will be based upon criteria of reestablishing or enhancing pre-mining uses of the land that are of economic importance. The map and related material will be produced in two stages, one in draft - reconnaissance form, the second in refined form based upon additional investigations and ready for publication.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

	TASK NO.	PROJECT OFFICER
☒	1	R. L. [illegible] USDA, Agricultural Research Service

Funds Estimate*	FY			
$75,000	76		1975	December 1979

*Funds approximate not for citation.

B. PHYSICAL AND CHEMICAL COAL CLEANING

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Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE

78 GDO

TITLE OF PROJECT

Coal Preparation Environmental Engineering Manual

NAME, DEPARTMENT, AND OFFICIAL TITLE OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

David C. Aunenkamp - Vice President - Program Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

J. J. Davis Associates
7900 West Park Drive, Suite 615
McLean, Va. 22101

SUMMARY OF PROPOSED WORK [illegible]

This program will provide to individuals outside the coal preparation industry an introduction to physical coal cleaning. Specifically the manual covers the general nature and characteristics of U.S. coals, provides an overview of the coal preparation plant, discusses equipment and processes currently in use in coal preparation, identifies the primary waste streams found during the coal cleaning operation, discusses the techniques of control currently applied to those waste streams and describes the contaminant removal potential of coal. The manual is currently in final stages of preparation.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]		PROJ. NO. 10D-11/3	PROJECT OFFICER Mark J. Stutsman [illegible] IERL-RTP	
FUNDS OBLIGATED $14,110	F.Y. 78	[illegible] N/A	STARTING DATE June 26, 1974	ESTIMATED COMPLETION DATE Dec 31, 1978

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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Form Approved [illegible]

PROJECT NO. [illegible]

NOTICE OF RESEARCH PROJECT

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[illegible]

TITLE OF PROJECT

Program Support for Fossil Fuel Processing and Synthetic Fuels

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Mr. Forest Mixon
Mr. John G. Cleland

NAME AND ADDRESS OF APPLICANT INSTITUTION

Research Triangle Institute
P. O. Box 12194
Research Triangle Park, North Carolina 27709

SUMMARY OF PROPOSED WORK [illegible]

The Contractor shall provide program support to the Environmental Protection Agency in each of the areas identified below:

1. Coal cleaning documentation to provide a concise and comprehensive summary of both physical and chemical coal cleaning.
2. Identification of specific pollutants from clean fuels processes.
3. Coal characterization to include coal analysis.
4. Computerize U. S. Bureau of Mines coal data in a systematic manner.
5. Prioritize, document and organize synthetic fuel related pollutants.
6. Evaluate the adequacy of existent synthetic fuels and coal cleaning control technology to meet present and projected environmental goals.
7. Develop a multi-media list of control and disposal options applicable to processes used in coal gasification and liquefaction.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	FILE NO. 1AB-11/4	PROJECT OFFICER [illegible] RESPONSIBLE ORGANIZATION IERL-RTP/EACD/FPB
FUNDS OBLIGATED [illegible]	[illegible]	STARTING DATE Dec. 22, 1975
		EXPECTED COMPLETION DATE Dec. 21, 1976

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

SSIE PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Process and Combustion Studies of Hydrothermally Treated Coals

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be Selected

SUMMARY OF PROPOSED WORK [illegible]

Caustic leaching of coals by the Battelle Hydrothermal Treatment Process (BHP) is capable of removing up to 95% of the pyritic sulfur and 40% of the organic sulfur. The process is also capable of removing significant amounts of ash and other pollutant forming constituents from coal. A previous program evaluated the [illegible] combustion and emission characteristics of raw and BHP coals in small laboratory combustors. In the proposed work these studies are to be extended to:

1. evaluate combustion of raw and BHP coals in larger stoker fired and multifuel furnaces.
2. evaluate and compare the combustion and emission characteristics of coals treated by other physical and chemical processes.

Experimental work and engineering analyses are also to be conducted to evaluate process improvements needed to lower the costs of caustic leaching.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X	TASK NO. [illegible]	PROJECT OFFICER James D. Kilgroe RESPONSIBLE ORGANIZATION IERL-RTP		
[illegible]	F.Y. 76	[illegible]	STARTING DATE Oct 1976	ESTIMATED COMPLETION DATE Oct 1978

[illegible]

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PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. (Do not use this space)

78 [illegible]

TITLE OF PROJECT

Coal Cleaning Technology Evaluation and Development

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

to be selected

SUMMARY OF PROPOSED WORK – [illegible]

Studies are to be performed to evaluate physical and chemical processes which may be used to remove sulfur and other pollutants from coal. A combination of experimental and engineering analysis work is required. Subtasks on the program are to include evaluations of:

1. Physical Coal Cleaning Techniques for Pyrite Removal from Fine Coal
2. Dewatering and Handling Techniques
3. Coal Preparation Requirements for Synthetic Fuel Processes
4. Chemical Coal Cleaning Processes
5. Pollution Control Technology for Coal Preparation Processes
6. The effects of cleaned coal on boiler and air pollution control device performance
7. The costs and performance of competing equipment and processes

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	TASK NO. [illegible]	PROJECT OFFICER James D. Kilgroe ORGANIZATIONAL DESIGNATION IERL-RTP

[illegible]	F.Y. 78	[illegible] 0	STARTING DATE Nov 1976	ESTIMATED COMPLETION DATE Nov 1978

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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PROJECT NO. (Do not use this space)

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78 [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

Environmental Assessment of Coal Cleaning Process

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

G. Ray Smithson, Jr., Manager, Env. Technology Program Office, Principal Investigator
Alexis W. Lemmon, Jr., Deputy Program Manager, Coal Cleaning Program

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle's Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

The primary objective of this study is to conduct a comprehensive assessment of environmental pollution which results from coal transportation, coal storage, coal cleaning and coal waste disposal. This assessment will include those pollutants which are currently regulated and all other pollutants whether gaseous, liquid or solid which pose potential significant health or ecological hazards.

All processes related to Coal Cleaning are being evaluated. These processes include but are not necessarily limited to those techniques or operations for: physical or chemical cleaning of steam coal to remove ash or sulfur, cleaning of metallurgical coal, and the cleaning of coal for synthetic fuel or chemical plants. Coal transportation evaluations will include assessments of transfer terminals, loading terminals, unloading terminals and transport by rail, barge, ship and truck. Potential pollution from coal storage at cleaning plants, transportation terminals and end-use plants also are being considered. Coal waste disposal assessment is being directed primarily at waste disposal at coal cleaning plants, however, coal mine waste disposal may be considered for specific cases.

The underlying ultimate goals of this work are to insure that environmentally acceptable processes are used in the expanded implementation of coal cleaning technology and to identify areas where pollution control technology development is needed.

IDENTIFY PARTICIPATING SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO.	PROJECT OFFICER
X [illegible]	1AB-013/B	James D. Kilgroe RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	EXPECTED COMPLETION DATE
800,000	78	8	July 1976	July 1979

EPA Form 5700-1 (7-73) REPLACES [illegible] MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

ROAP

76 CIDC

TITLE OF PROJECT

Characterization of Coal and Coal Residue

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON THE PROJECT

Dr. N. F. Shimp, Principal Chemist, Project Director; Dr. R. R. Ruch, Chemist and Head Analytical Chemistry Section, Principal Investigator; Dr. D. R. Dickerson, Organic Chemist, Principal Investigator; Dr. J. Thomas, Physical Chemist, Principal Investigator; Mr. R. H. Shiley, Assoc. Organic Chemist, Investigator; Dr. R. D. Harvey, Geologist, Investigator.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Illinois State Geological Survey
Natural Resources Building
University of Illinois, Urbana, IL 61801

SUMMARY OF PROPOSED WORK – [illegible]

1) Objectives: To characterize coal, its products, byproducts, and wastes with regard to their pollutants and possible mechanisms for control.

2) Approach: Reliable methods will be developed or refined for identification of the location, circumstances, and form in which organically-combined potential pollutants in coal are bound and released.

3) Current Plans: Relatively unaltered organic portions from well-characterized whole coals will be subjected to low and medium temperature pyrolysis. Volatile products, including organically-combined heavy metals and sulfur, will be trapped and analyzed by means of gas chromatography, mass spectrometry, neutron activation, atomic absorption, energy dispersive X-ray fluorescence and other methods. Physical and chemical properties of the coals will be related to the composition of volatile products produced under various temperatures, heating rates, and atmospheres. Methods of achieving a mass balance for selected volatile constituents will be developed where applicable. The data obtained will be such that elements may be quantitatively divided between the organic and inorganic portions of whole coal and relatable to various coal conversion processes.

[illegible] Illinois State Geological Survey	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 2(C)-2	PROJECT OFFICER William J. Rhodes RESPONSIBLE ORGANIZATION IERL-RTP

[illegible] $170,000	FY 76	[illegible] [illegible]	STARTING DATE 11-75	[illegible] COMPLETION DATE 5-77

EPA Form 5760-1 (7-73)   REPLACES [illegible] WHICH MAY NOT BE USED.

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

SSIE [illegible]

76 [illegible]

TITLE OF PROJECT

Reactor Test Project for Chemical Removal of Pyritic Sulfur from Coal

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

R. A. Meyers - Project Manager
L. J. Van Nice - Chief Engineer
M. J. Santy - Work Package Manager
E. P. Koutsoukos - Work Package Manager
[illegible] - Work Package Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRW Systems Group, TRW, Inc.
One Space Park
Redondo Beach, California 90278

SUMMARY OF PROPOSED WORK [illegible]

The Contractor will construct a reactor test unit for evaluation of the pyrite leaching from fine coal, leach solution regeneration, and initial filtration operations of the Meyers Process for coal desulfurization. The Reactor Test Unit will be capable of continuous operation at the nominal rate of 250-750 pounds of coal per hour. The input material to the Test Reactor System is properly sized coal, either cleaned or uncleaned; the output material is the reacted coal which has been filtered and washed on the filter. This test unit will be constructed in accordance with the predesign specifications prepared under Contract 68-02-1335 for the reactor test unit (omitting the coarse coal reactor system). The reactor test unit will be erected at a site provided by the Contractor.

IDENTIFY PROFESSIONAL HEALTH INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR AGENCY USE ONLY

SUPPORT METHOD [illegible]	GRANT NO. EHQ-81/?	IERL-RTP/EACD/FCB		
FUNDS OBLIGATED $1,000,000	F.Y. 76	[illegible]	STARTING DATE May 6, 1976	ESTIMATED COMPLETION DATE May 15, 1977

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SIE

EPA 76 [illegible]

TITLE OF PROJECT

Pollution from Combustion of Hydrothermally Treated Coals

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

E. P. Stambaugh, H. H. Grotta, A. Levy, E. L. Merryman, J. B. McNulty, K. C. Sekhar and J. H. Oxley

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

The Battelle Hydrothermal Treatment Process (HTP) is a chemical leaching process capable of removing up to 95% of the pyritic sulfur and 40% of the organic sulfur from a variety of coals. This process offers a technically and economically attractive method for producing low sulfur fuel from high-sulfur coals. The objective of this program is to provide an environmental evaluation of the Battelle process for removal of pollutant-forming constituents.

Work under the program is to include

The performance of combustion studies on hydrothermally treated coals and the corresponding raw coals

The characterization of hydrothermally treated coals, the corresponding raw coals and selected spent leachants

An valuation of the environmental impact of replacing coals now used in conventional boilers with hydrothermally treated coals

An assessment of the use of hydrothermally treated coals on the performance and operation of utility and industrial boilers

An evaluation of the potential of producing terephthalic acid from solubilized coal.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

X [illegible]	TASK NO. [illegible]-01/7	PROJECT OFFICER James D. Kilgroe RESPONSIBLE ORGANIZATION IERL-RTP		
FUNDS [illegible] 106,141	F.Y. 76	[illegible]	STARTING DATE June 1975	ESTIMATED COMPLETION DATE October 1976

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

TITLE OF PROJECT

Bench Scale Study of the Meyers Process for Coal Desulfurization

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

R. A. Meyers R. Orsini
E. P. Koutsoukos M. J. Santy
J. W. Hamersma

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRW Systems Group, TRW, Inc.
One Space Park
Redondo Beach, California 90278

SUMMARY OF PROPOSED WORK [illegible]

The Contractor shall process different types of raw coal through a bench scale facility for chemical leaching of pyritic sulfur from coal. The Contractor shall completely characterize the raw coal samples and shall determine at least proximate and ultimate analyses and sulfur forms analyses. The Contractor shall also examine the raw coal samples for trace constituents. The Contractor shall, as a minimum, gather the following data:

1. Sulfur removal by chemical leaching as a function of time.
2. Characterization of the products.
3. Trace element distribution in the products.

[illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

FILE NO. [illegible]

PROGRAM OFFICE
IERL-RTP/[illegible]/EPA

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	EXPECTED COMPLETION DATE
$191,074	[illegible]		Nov. 3, 1975	June 3, 1977

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

78 ODD

TITLE OF PROJECT

Development Program for Treatment of Coal to Produce Low-Sulfur, Solid Fossil Fuel

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Manager: D. K. Fleming, Assistant Director, Process Evaluation
R. D. Smith
M. R. V. Aquino

NAME AND ADDRESS OF APPLICANT INSTITUTION

Institute of Gas Technology
3424 South State Street
Chicago, Illinois 60616

SUMMARY OF PROPOSED WORK [illegible]

The objective of this program is to determine on a bench- and pilot-unit scale the operating parameters for the IGT Process to desulfurize coal by thermal and chemical means.

Coal will be treated with a reducing atmosphere in the presence of a sulfur getter. Sulfur removal will be determined as a function of temperature, residence time, coal/getter ratio, coal composition, and particle size.

In work to date under earlier contracts, Midwestern coal with 3.5-4% sulfur content has been converted into solid fossil fuel that be burned directly in conformance with Federal EPA New Source Performance Standards for sulfur emission.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD	GRANT NO.	PROJECT OFFICER RESPONSIBLE ORGANIZATION
[illegible]	EHQ-81/F	IERL-RTP/EACD/FPB

FUNDS	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$100,000	76		Nov. 3, 1975	June 30, 1977

EPA Form 5700-1 ([illegible]) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0081

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

[illegible]

TITLE OF PROJECT

Coal Desulfurization by Microwave Energy

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Peter D. Zavitsanos, Senior Physical Chemist, RESD
Paul D. Gorsuch, Senior Materials Engineer, RESD
Joseph A. Golden, Physicist, RESD
Herbert Thal, Staff Engineer, Space Systems

NAME AND ADDRESS OF APPLICANT INSTITUTION

General Electric Company
Reentry & Environmental Systems Division
P.O. Box 8555, Philadelphia, Pa. 19101

SUMMARY OF PROPOSED WORK [illegible]

The objective of this program is to conduct research and development which will lead into a cost effective method for reducing sulfur oxide emissions (during coal combustion) to environmentally acceptable levels.

The approach is based on the use of microwave energy which can be coupled preferentially into iron pyrites and leachants and induce reactions which produce sulfur compounds which can either be separated easily from coal, or do not convert into sulfur oxides during combustion.

Results to date show that iron pyrite (FeS_2) and NaOH do indeed couple with microwave efficiently and react to form water soluble sulfur products. Coal on the other hand is a low loss material. The plan is to investigate the mechanism of energy absorption and important reactions involving sulfur rearrangement.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	GRANT NO. [illegible]	PROJECT OFFICER James D. Kilgroe RESPONSIBLE ORGANIZATION IERL-RTP	
TOTAL FUNDS $80,000	F.Y. 76	[illegible]	STARTING DATE July 1976	ESTIMATED COMPLETION DATE July 1977

EPA Form 5700-1 (2-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0011

PROJECT NO. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT
Mineral Matter in Coal

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OF PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Harold J. Gluskoter, Head Coal Section
William G. Miller, Assistant Geologist

NAME AND ADDRESS OF APPLICANT INSTITUTION
The Board of Trustees of the University of Illinois
Illinois State Geological Survey
Urbana, Ill. 61801

SUMMARY OF PROPOSED WORK [illegible]

Studies will be continued to characterize the mineral matter, trace elements and chemical composition of coals, concentrating on those from the Illinois Basin. The techniques used will include radio-frequency low-temperature ashing and x-ray diffraction spectroscopy. Following these analyses, statistical relationships between major, minor, trace elements and mineral matter will be determined. The elemental and mineral distributions will also be mapped stratigraphically and areally. These data and the analyses of their distribution will be used to suggest relationships to the environments of deposition of the coals and to the geochemical environments which have affected the coal seams since their deposition.

Studies will also be performed to evaluate the trace element and mineral distribution in the various size fractions and specific gravity ranges associated with physical coal washing.

SIGNATURE OF PRINCIPAL INVESTIGATOR | DATE

FOR AGENCY USE ONLY

PROJECT OFFICER
James D. Kilgore

GRANT NO.
R804[illegible]

RESPONSIBLE ORGANIZATION
IERL-RTP

STARTING DATE
Jan 1976

ESTIMATED COMPLETION DATE
Jan 1978

FUNDS OBLIGATED
80,000

FY
76

EPA Form [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	PROJECT NO. [illegible] **EPA-IAG-D6-E681-[illegible]**

TITLE OF PROJECT

Identification of Refractory Organic Compounds in Treated Refinery Wastewaters

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N. F. Sather - Project Director, Energy and Environmental Systems Division
E. J. Croke - Division Director, Energy and Environmental Systems Division
W. Harrison - Project Director, Energy and Environmental Systems Division
L. Raphaelian - Environmental Chemist, Energy and Environmental Systems Division

NAME AND ADDRESS OF APPLICANT INSTITUTION

Argonne National Laboratory
9700 S. Cass Avenue
Argonne, Illinois 60439

SUMMARY OF PROPOSED WORK [illegible]

The "final" effluent water of oil-refineries is contaminated with organic compounds that have not been eliminated by the typical wastewater treatment techniques, and with organics that are sometimes produced in the activated-sludge treatment process itself. These organics are commonly referred to as "refractory organics." The stipulated EPA model for removal of refractory and other organics in petroleum refinery wastewater streams is outlined in EPA's "Refining Guidelines Document" and involves the use of mixed-media filtration and activated-sludge, plus activated carbon for the 1983 best available treatment economically achievable (BATEA). As a first step in the assessment of this proposed treatment technology, identification must be made of trace organics in refinery effluents which are both refractory from and absorbed by activated carbon. The research proposed here seeks to characterize refractory organics occurring in final effluents from the activated-sludge treatment plants of four petroleum refineries and from the effluent after it has then passed through temporarily-installed activated carbon columns. It is also the goal of this research to quantify the effectiveness of the activated-sludge/activated carbon water treatment system for removing organics. An evaluation of what needs to be done, and the cost of the required technology, will be incorporated in a final report.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR W. Harrison	DATE October 28, 1976

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☒ [illegible] ☐ [illegible] ☐ [illegible]	TASK NO. 1-8	PROJECT OFFICER William A. [illegible] SPONSORING ORGANIZATION [illegible]

FUNDS ALLOCATED $122,000 [illegible]	F.Y. 76	[illegible]	START DATE	ESTIMATED COMPLETION DATE October 1978

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

C. FLUE GAS CLEANING

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Flue Gas Cleaning

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO.

EPA

GID

TITLE OF PROJECT

Conduct of Novel Devices and Fabric Filter Control Technology Conferences

[illegible]

Mr. Norman Surprenant - Principal Investigator
Mr. Richard Dennis
Mr. Douglas Cooper — Senior Investigators
Mr. Paul Donnelly
Robert Hall - Engineering Support

N/A

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

GCA/Technology Division for this program will conduct two technology transfer
onferences, prepare two draft capsule reports, and prepare six executive summaries.
he two technology transfer conferences will emphasize the collection of fine par-
iculates in order to facilitate compliance with emission standards. Conference ob-
ectives are to stimulate new ideas for fine particulate control and to promote inter-
hange of ideas among experts and users of such devices.

The two draft capsule reports will deal with the transfer of technology in the
ine particulate control area, in a format that is similar to previously published
PA capsule reports. These reports, aimed at the upper management of industry or
overnment, will summarize the technology and its method of operation, assess the
ignificance of the new technology with regard to its performance and application to
ew sources, and evaluate the economics of installing and operating the new technology.

The six executive summaries will discuss the approach followed and the signifi-
ance of the work reviewed. The subjects for these summaries will be major experi-
ental programs based primarily on past and present GCA activities in the fine particu-
ate control area.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Norman Surprenant	DATE 06 August 1976

FOR OFFICE USE ONLY

PROJECT OFFICER
Dennis Drehmel
IERL, Research Triangle Park, N.C.

69,708	76	[illegible]	8/20/76	5/10/77

EPA Form 5760-1 (8-73) [illegible]

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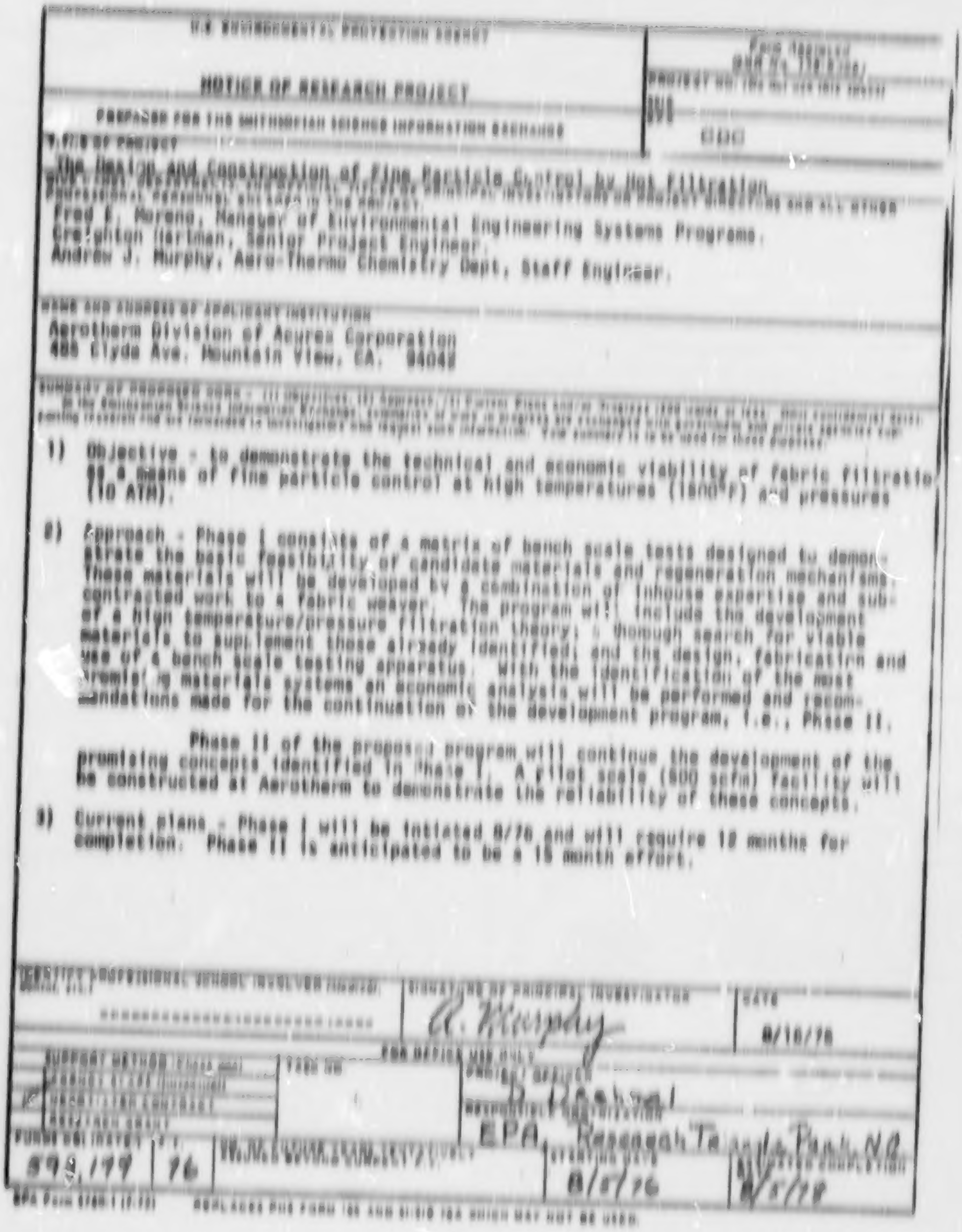

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

The Design and Construction of Fine Particle Control by Hot Filtration

Fred E. Moreno, Manager of Environmental Engineering Systems Programs.
Creighton Hartman, Senior Project Engineer.
Andrew J. Murphy, Aero-Thermo Chemistry Dept, Staff Engineer.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Aerotherm Division of Acurex Corporation
485 Clyde Ave. Mountain View, CA. 94042

SUMMARY OF PROPOSED WORK [illegible]

1) Objective - to demonstrate the technical and economic viability of fabric filtratio[illegible] as a means of fine particle control at high temperatures (1800°F) and pressures (10 ATM).

2) Approach - Phase I consists of a matrix of bench scale tests designed to demonstrate the basic feasibility of candidate materials and regeneration mechanisms. These materials will be developed by a combination of inhouse expertise and subcontracted work to a fabric weaver. The program will include the development of a high temperature/pressure filtration theory; a thorough search for viable materials to supplement those already identified; and the design, fabrication and use of a bench scale testing apparatus. With the identification of the most promising materials systems an economic analysis will be performed and recommendations made for the continuation of the development program, i.e., Phase II.

Phase II of the proposed program will continue the development of the promising concepts identified in Phase I. A pilot scale (500 scfm) facility will be constructed at Aerotherm to demonstrate the reliability of these concepts.

3) Current plans - Phase I will be initiated 8/76 and will require 12 months for completion. Phase II is anticipated to be a 15 month effort.

SIGNATURE OF PRINCIPAL INVESTIGATOR: A. Murphy

DATE: 8/16/76

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PROJECT OFFICER: D. Drehmel

EPA, Research Triangle Park, N.C.

598,179

76

STARTING DATE: 8/5/76

8/5/78

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

[illegible]

TITLE OF PROJECT

The effects of high temperature and pressure on particle collection mechanisms

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: Dr. Seymour Calvert
Project Engineer: Dr. Richard Parker

NAME AND ADDRESS OF APPLICANT INSTITUTION

Air Pollution Technology, Inc.
4901 Morena Blvd., Suite 402
San Diego, California 92117

SUMMARY OF PROPOSED WORK — [illegible]

The objective is to conduct a theoretical and experimental investigation to determine the effects of high temperature (1100°C), high pressure (15 atm), and particle diameter on particulate collection mechanisms, and to identify mechanisms that might be used to remove particles from high temperature and/or high pressure gas streams. Existing and proposed energy processes requiring high temperature and/or high pressure particulate cleanup will also be studied to determine the important characteristics, cleanup requirements, and potential problems of each process.

The investigation will include a thorough literature search, survey, and evaluation of the present state of knowledge concerning high temperature and pressure aerosol mechanics and collection mechanisms. Laboratory scale experiments will be conducted to obtain necessary data on the behavior of aerosols in high temperature and pressure environments, and the results will be used to improve present theory, to identify useful high temperature and high pressure collection mechanisms for particulate removal, and to recommend programs for the development and demonstration of particulate control devices based upon these mechanisms.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Seymour Calvert	DATE Dec. 16, 1975

FOR OFFICIAL USE ONLY

[illegible]	TASK NO. 8A	PROJECT OFFICER D.C. Drehmel RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED 65,149	F.Y. 76	[illegible]	STARTING DATE 12/05/75	ESTIMATED COMPLETION DATE 06/04/76

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

CDC

TITLE OF PROJECT

A GRANULAR BED FILTER SYSTEM STUDY

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Project Director: Dr. Seymour Calvert, President of A.P.T., Inc.

Project Engineer: Dr. Richard Parker, Environmental Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Air Pollution Technology, Inc.
4901 Morena Blvd., Suite 402
San Diego, CA 92117

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this project are:

1. to assess current granular bed filter technology for control of airborne particulate pollutants;
2. to evaluate existing granular bed filter systems;
3. to develop engineering models and design equations to predict filter performance;
4. to survey present usage problems; and
5. to evaluate the potential of granular bed filters for high temperature and pressure applications.

A test plan will be proposed and conducted to evaluate two granular bed filters operating at high temperature and pressure. Research and development recommendations will be made.

IDENTIFY PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Seymour Calvert	DATE 10/5/76

FOR OFFICE USE ONLY

FUNDING METHOD [illegible] [illegible] ✓ [illegible] [illegible]	TASK NO. [illegible]	PROJECT OFFICER RESPONSIBLE ORGANIZATION EPA, IERL, Research Triangle Park, NC

FUNDS OBLIGATED 143,040	F.Y. 76	[illegible]	STARTING DATE 9/16/76	DATE FOR COMPLETION 3/16/76

EPA Form 5760-1 (7-73) REPLACES EPA FORM 163 AND SIE-1, WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

78 GDG

TITLE OF PROJECT

New Concept for Fine Particle Control at High Temperature and Pressure

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Project Director: Dr. Seymour Calvert

Project Engineer: Dr. Ronald G. Patterson

NAME AND ADDRESS OF APPLICANT INSTITUTION

AIR POLLUTION TECHNOLOGY, INC.
4901 Morena Blvd., Bldg. 402
San Diego, California 92117

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. [illegible] to the Smithsonian Science Information Exchange. Summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Objectives - The development of advanced energy sources such as coal and shale oil gasification result in high temperature and pressure process gas streams which require removal of particulates before utilization. The objective of this research is to evaluate a novel concept for fine particle control in these systems. The apparatus would collect fine particles by mechanisms such as diffusion, inertial impaction, interception and electrophoresis.

Approach and Progress - A preliminary evaluation of the new concept will be performed, followed by experimental verification of fine particle collection. Presently theoretical calculations are being performed for mechanisms involved in particle collection and system regeneration. The power and residence time requirements for particle capture will be predicted for the most promising mechanisms. Based on these calculations, preliminary bench-scale experiments will be performed to demonstrate the feasibility of fine particle capture in the proposed particle collection system. This will be followed by the economic analysis and recommendations. The second phase of the project will consist of the construction and testing of a model of the new concept with at least 500 ACFM capacity.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)

SIGNATURE OF PRINCIPAL INVESTIGATOR

Seymour Calvert

DATE

Aug. 27, 1976

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SUPPORT METHOD (Check one)

X [illegible]

TASK NO.

8(q-8)/A

PROJECT OFFICER

D. C. Drehmel

RESPONSIBLE ORGANIZATION

IERL-RTP

FUNDS OBLIGATED

$431,381

F.Y.

76

NO. OF FUTURE YEARS OF PROBABLE SUPPORT BEYOND CURRENT F.Y.

STARTING DATE

6/77

ESTIMATED COMPLETION DATE

8/9/78

EPA Form 5760-1 (2-76) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

DATE
76 [illegible]

TITLE OF PROJECT
Design, Fabricate, and Install a Pilot Scale Electrostatic Precipitator

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON PROJECT
Co-Principal Investigator, Fred V. Venditti, Head, Sys. Engr. Lab., Electronics Div., DRI
Principal Investigator, George A. Simard, Res. Engineer, Electronics Division, DRI
William J. Culbertson, Research Engineer, Chemistry Division, DRI
Thomas B. Nevens, Jr. Research Engineer, Chemistry Division, DRI
Wayne A. Alford, Research Engineer, Electronics Division, DRI

NAME AND ADDRESS OF APPLICANT INSTITUTION
University of Denver
P. O. Box 10127
Denver, Colorado 80210

SUMMARY OF PROPOSED WORK [illegible]

OBJECTIVE:

The objective of the project is to provide a pilot-scale electrostatic precipitator (ESP) at the research EPA facility in Research Triangle Park, N. C. The ESP will provide maximum flexibility, and accuracy consistent with the basic requirement that its general configuration be similar to that of full-scale electrostatic precipitators. A burner, humidifier, and a specially designed aerosol generator will be included in order to provide a wide variety of atmospheres in the precipitator unit. The feasibility of providing a wet-dry facility will be investigated.

APPROACH:

Phase 1: Prior to designing the precipitator, a survey of existing pilot-scale installations will be made and experts in the field of ESP design and application will be interviewed. With these background data, the features and parameters of the pilot scale ESP will be established and the design will be undertaken.

Phase 2: The second part of the effort will be to fabricate and assemble the precipitator at the Cherry Creek Field Site facility of the University of Denver for check-out. Having proven the unit, it will be partially dismantled, shipped to Research Triangle Park, N. C. and re-assembled.

CURRENT PLANS/PROGRESS

Current activity is being devoted to fabricating the precipitator for assembly at the University of Denver.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED IN WORK Denver Research Institute	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT: OTHER [illegible] X [illegible]	TASK NO. '8(Q-8)/8	PROJECT OFFICER D. H. Ramsey RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED 60857	F.Y. 76	[illegible] 1	STARTING DATE 11-14-75	EXPECTED COMPLETION DATE 9/77

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0081

PROJECT NO. (Do not use this space)

TITLE OF PROJECT

An Evaluation of a Hot-Side Electrostatic Precipitator

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Grady B. Nichols, Head, Environmental Engineering Division
John P. Gooch, Head, Control Device Research Section

NAME AND ADDRESS OF APPLICANT INSTITUTION

Southern Research Institute
2000 Ninth Avenue, South
Birmingham, Alabama 35205

SUMMARY OF PROPOSED WORK – [illegible]

The objective of this project is to conduct an evaluation of a hot-side electrostatic precipitator collecting fly ash resulting from the combustion of low sulfur coal in a large (at least 300 megawatts) coal fired utility boiler. The evaluation will consist of the following tasks: (1) A limited survey to collect relevant data concerning the use of hot-side electrostatic precipitators on utility boilers burning low sulfur western coals. (2) A comprehensive field test in which overall particle collection efficiency and efficiency as a function of particle diameter are determined at a selected installation. (3) An engineering analysis to define the performance and economics of the electrostatic precipitator. The Navajo Station of the Salt River Project has been selected as the site for the study. In addition to the particulate collection efficiency measurements, the following data will be obtained during the field test: precipitator operating parameters, flue gas analysis, particle resistivity, plume opacity, and elemental composition as a function of particle diameter of the particulate entering and leaving the precipitator.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 9/23/76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) AGENCY STAFF (Intramural) ✓ NEGOTIATED CONTRACT RESEARCH GRANT	FORM NO. [illegible]	PROJECT OFFICER L. E. Sparks RESPONSIBLE ORGANIZATION EPA, IERL, Research Triangle Park, N.C.

FUNDS OBLIGATED 195,550	F.Y. 76	[illegible]	STARTING DATE 9/16/76	EXPECTED COMPLETION 9/15/77

EPA Form 5100-1 (3-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]
PROJECT NO. [illegible]
78 [illegible]

TITLE OF PROJECT
Technical Support for USA/USSR Cooperative Agreement

[illegible] PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. G. Ray Smithson, Manager
Mr. Basil P. Goroff, Consultant

NAME AND ADDRESS OF APPLICANT INSTITUTION
Battelle Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF [illegible]

Battelle Columbus Laboratories will provide technical support to the Sub-Working Group of the Stationary Source Air Pollution Control Technology USA/USSR Cooperative Agreement in certain areas including:

1. Assist in furnishing to the USA required information
2. Review of USSR furnished information
3. Attend meetings and record of proceedings
4. Visit USSR during the 2nd qtr FY-76

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO.	PROJECT OFFICER
[illegible]	1B(3-13)	[illegible]
		RESPONSIBLE ORGANIZATION
		IERL-RTP/[illegible]

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$75,000	76		Sept 22, 1975	[illegible]

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0081

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE

EPA 76 0D41

TITLE OF PROJECT

Technical Support for Environmental Problem Definition and Pollutant System Studies

NAME AND DEPARTMENT OF PRINCIPAL INVESTIGATOR(S) OR PROJECT DIRECTOR(S) AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. E. C. Cavanaugh	Mr. T. P. Nelson
Mr. J. D. Colley	Mr. W. L. Owen
Mr. J. R. Carroll	

NAME AND ADDRESS OF APPLICANT INSTITUTION

Radian Corporation
8500 Shoal Creek Blvd.
P. O. Box 9948
Austin, Texas 78766

SUMMARY OF PROPOSED WORK - (1) Objectives (2) Approach (3) Current Plans and/or Progress (200 words or less). Such summaries given to the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

The Contractor shall provide program supporting technical services to EPA to assess hydrocarbon emission/effluent quantity, quality, and control potential for existing stationary discharge sources.

The Contractor shall gather, review and evaluate information on hydrocarbon discharges from stationary sources and shall develop sub-group classes for each of the major source categories. The Contractor shall also identify specific process or operations which are hydrocarbon emission/effluent sources.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD (Check one)	TASK NO. 1B(J-10)	PROJECT OFFICER RESPONSIBLE ORGANIZATION IERL-RTP/EACD/EPA

FY OBLIGATED $110,000	F.Y. '76	NO. OF PERSON YEARS (IF APPLICABLE)	STARTING DATE NOV 11, 1975	ESTIMATED COMPLETION DATE OCT 30, 1976

EPA Form 2560-1 (7-72) REPLACES PHS FORM 4B AND 5-210 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

SSIE
EPA [illegible]

TITLE OF PROJECT
Bench Scale Testing of Generic Types of Cleanup Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

The objective of the program is the operation of a bench scale gasifier and gas cleaning facility to determine operation characteristics and environmental impact of raw and acid gas cleanup systems. The approach is to operate a versatile gas cleanup system using a variety of commercially absorber types with acid gas from a representative gasifier.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]
NA

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

TASK NO.
14

PROJECT OFFICER
Mark J. Stutsman

RESPONSIBLE ORGANIZATION
IERL-RTP

FUNDS OBLIGATED

F.Y.

[illegible]

STARTING DATE
6/77

ESTIMATED COMPLETION DATE

EPA Form 5700-1 (2-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

[illegible]

TITLE OF PROJECT

Design and Construction of Gas Cleaning Test Facility

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

E. J. Clark - Manager Fuels & Combustion Program Manager

J. E. Ferrell - Technology Directorate - Project Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Aerotherm Division
Acurex Corporation
485 Clyde Ave., Mt. View California 94042

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. [illegible]

OBJECTIVE: This program will provide EPA with a facility to investigate potential environmental controls, raw and acid cleanup systems for coal gasification.

APPROACH: A bench-scale coal gasifier and gas cleaning facility will be installed to allow a through study of gasifier product gas constituents, gas cleanup systems, and other environmental controls. Special attention will be devoted to providing modular cleanup systems and chemical constituent analytical equipment. The resulting facility will be capable of providing detailed assessments of the environmental effectiveness of a variety of cleanup strategies.

CURRENT PLANS: Aerotherm will prepare a final design for the facility; fabricate or purchase the components; install the system on-site at North Carolina State University, Raleigh, North Carolina; and conduct startup operations. The Institute of Gas Technology, Chicago, Illinois, will supply the gasifier and coal feed system under subcontract to Aerotherm.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		

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CURRENT NATURE [illegible]	TASK NO.	PROJECT OFFICER Mark J. Stutsman RESPONSIBLE ORGANIZATION IERL-RTP
[illegible]	14(C)-141/6	

FUNDS OBLIGATED	FY	NO. OF FUTURE YEARS TENTATIVELY REQUIRED BEYOND CURRENT FY	STARTING DATE	ESTIMATED COMPLETION DATE
$380,000	76	1	July 9, 1976	Nov 9, 1977

EPA Form 5700-1 (7-73) REPLACES PHS FORM 166 AND SSIE 166 WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0061

PROJECT NO. (Do not use this space)

SSIE

7M (??)

TITLE OF PROJECT
Review and Develop Test Plans and Measurement Programs

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

George Erskine, Program Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION
The Mitre Corporation
Westgate Research Park
McLean, Virginia 22101

SUMMARY OF PROPOSED WORK [illegible]

The IERL-RTP is responsible for research, development and demonstration of air pollution control technology for stationary sources of pollution. Many of the engineering studies performed require complex measurement programs to provide the detailed information necessary for technical and economic evaluation of the process. The primary objective of this project is to provide an independent review of the test and measurement programs and to provide assistance in the development and/or modification of such programs.

Efforts undertaken will include a review of sampling locations and equipment selection, analytical techniques proposed, data handling procedures and quality assurance programs for selected major engineering studies. Recommendations for alternative or modified approaches will be developed and cost/information evaluations performed. On-site evaluations of measurement program implementation will be used as a mechanism for quality control.

Present work includes the development of generalized approaches to measurement program cost estimating.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
NA		8/24/76

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SUPPORT METHOD	TASK NO.	PROJECT OFFICER / RESPONSIBLE ORGANIZATION
X [illegible]	17(Q-18)	L. D. Johnson IERL-RTP, IPD, PMB

FUNDS OBLIGATED	FY	NO. OF FUTURE YEARS	STARTING DATE	ESTIMATED COMPLETION DATE
46,810	76	0	Dec. 5, 1974	May 1, 1977

EPA Form 5760-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

EMA

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO.

[illegible]

Sampling and Analysis of "Reduced" and "Oxidized" Species in Process Streams

Dr. Carl A. Flegal-Program Manager, Applied Chemistry Department
Dr. Raymond F. Maddalone-Principle Investigator, Applied Chemistry Department
Dr. Arnold Grant-Work Unit Manager, Applied Chemistry Department
Mr. Christopher Shih-Work Unit Manager, Chemical Engineering Department
Dr. Edward F. [illegible]-Work Unit Manager, Engineering Sciences Department

TRW Defense and Space Systems Group
01/2030, One Space Park
Redondo Beach, California 90278

Under this contract, TRW will conduct a continuing program for the evaluation, development, testing and field adaptation of measurement techniques for elemental analysis and inorganic compounds identification in process and effluent streams. The primary objective of this program is to provide the measurement methodologies required for environmental assessment and control technology development projects related to the stationary source, energy and industrial process programs of the EPA. TRW will be responsible for conducting both the basic development effort and the programs necessary to apply and evaluate the application of these and other sampling and analytical techniques on specific engineering studies. The five (5) major program work areas are:

1. Measurement Methods Evaluation and Development
2. Methods Adaptation and Application Studies
3. Measurement and Test Program Reviews
4. Sampling and Analytical Support
5. Preparation of Guidelines and Procedures

N/A		DATE August 16, 1976

FOR EPA USE ONLY

	TASK NO. 10	PROJECT OFFICER Robert M. Statnick IERL-RTP, IPD, PMB

$379,003	76	2	July 20, 1976	July 20, 1979

EPA Form

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

Sampling and Analysis of "Reduced" and "Oxidized" Species in Process Streams

[illegible]

Dr. Carl A. Flegal, Program Manager, Applied Chemistry Department
Dr. Raymond F. Maddalone, Principle Investigator, Applied Chemistry Department
Mr. Arnold Grant, Work Unit Manager, Applied Chemistry Department
Dr. Christopher Shih, Work Unit Manager, Chemical Engineering Department
Mr. [illegible], Work Unit Manager, Engineering Sciences Department

[illegible]
TRW Defense and Space Systems Group
01/2030, One Space Park
Redondo Beach, California 90278

SUMMARY OF PROPOSED WORK [illegible]

Under this contract, TRW will conduct a continuing program for the evaluation, development, testing and field adaptation of measurement techniques for elemental analysis and inorganic compounds identification in process and effluent streams. The primary objective of this program is to provide the measurement methodologies required for environmental assessment and control technology development projects related to the stationary source, energy and industrial process programs of the EPA. TRW will be responsible for conducting both the basic development effort and the programs necessary to apply and evaluate the application of these and other sampling and analytical techniques on specific engineering studies. The five (5) major program work areas are:

1. Measurement Methods Evaluation and Development
2. Methods Adaptation and Application Studies
3. Measurement and Test Program Reviews
4. Sampling and Analytical Support
5. Preparation of Guidelines and Procedures

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR AGENCY USE ONLY

SUPPORT METHOD [illegible] ☐ GRANT ☒ CONTRACT ☐ IN-HOUSE	FILE NO. 3/16	PROJECT OFFICER R. M. Statnick RESPONSIBLE ORGANIZATION IERL-RTP, IPD, PMB

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
597,349	76	0	Feb. 16, 1976	Nov. 30, 1976

EPA Form 5760-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT

Sampling and Analysis Methods Research and Development

[illegible]

Project Supervisor: Clifford E. Decker, Manager, Environmental Measurements Dept. (EMD)
Project Leader: Franklin Smith, Supervisor, Quality Assurance Section in the EMD
Dr. James Buchanan
Dr. Denny Wagoner

NAME AND ADDRESS OF APPLICANT INSTITUTION

Research Triangle Institute
P. O. Box 12194
Research Triangle Park, North Carolina 27709

SUMMARY OF PROPOSED WORK [illegible]

Objective: The Environmental Protection Agency in its energy and industrial processes programs is involved in numerous and varied environmental assessment and technology development projects. The objective of this project is to develop, evaluate, adapt, and provide guidelines for the application of quality control and assurance practices and procedures to various measurement systems, devices, and procedures utilized in the above projects.

Approach: The RTI team proposed for this contract has formal training in chemistry, chemical engineering, electrical engineering, and statistics with experience in sampling and analyzing materials in stationary source processes, control devices, and effluent streams.

A systems approach will be utilized in developing quality assurance plans consisting of an optimum mix of techniques such as material balances, interrelating of process engineering data and control system parameter values with effluent stream measurements, maintenance of quality control charts and other statistical techniques, and quantitative performance audits to yield the maximum quality assurance at the minimum cost.

Plans: The basic plan is to prepare general QC/QA plans for a project type, then evaluate the plan by short term implementation at selected IERL/RTP project sites. After field evaluation a QC/QA specific to the project type is prepared. A QA plan specific to the demonstration scale projects has been prepared.

NA	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	10/10	PROJECT OFFICER Larry D. Johnson RESPONSIBLE ORGANIZATION EPA/IERL-RTP

41,582	76	0	STARTING DATE May 3, 1976	ESTIMATED COMPLETION DATE May 1, 1977

EPA Form 5700 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE 78 [illegible]

TITLE OF PROJECT:

Performance Study of Full-Scale Limestone Scrubbing

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: T. A. LiPuma

Contract No. EPA 78-141

NAME AND ADDRESS OF APPLICANT INSTITUTION

Engineering Science, Inc.
7903 Westpark Drive
McLean, VA 22101

SUMMARY OF PROPOSED WORK [illegible]

Objective:

To evaluate the performance and characterize the operation of a full-scale utility wet limestone scrubbing flue gas desulfurization (FGD) system installed at the 37 Mw Stock Island plant of the Key West City Electric System.

Approach:

Sulfur dioxide and particulate matter removal will be evaluated under various conditions of FGD system and power plant operation. The independent variables to be considered are, pressure drop, slurry concentration, stoichiometry, gas flow rate and reactant particle size.

Current Plans:

The boiler and FGD system will be operated by the City Electric System. The test program including sampling, analysis, and reporting results will be conducted by Engineering Science, Inc. It is anticipated that the test period will be about two months.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 22 Sept. 1978

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X	TASK NO. 1(P-1)	PROJECT OFFICER Norman Kaplan RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED $40,000	F.Y. 78	[illegible] 1	STARTING DATE June 1978	ESTIMATED COMPLETION DATE Dec. 1978

EPA Form 5760-1 (7-73) REPLACES NSF FORM 1B AND SSIE 1BA WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

76 [illegible]

TITLE OF PROJECT

Stack Gas Reheat Assessment Study

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

In flue gas desulfurization systems employing aqueous scrubbing liquids, the temperature of the flue gas is lowered to about 125 degrees F. The flue gas also becomes saturated with water vapor and contains entrained liquid. In order to protect equipment downstream of the scrubber from corrosion and solids deposition and to improve plume dispersion from stacks, it generally is necessary to reheat the stack gas downstream of the scrubber. However, stack gas reheat increases the capital and operating costs of the FGD system, and some types of reheaters are subject to corrosion and solids deposition which decrease the overall reliability of the system.

The purpose of this work is to survey current practice in the utility industry to assess the present status of reheat technology, to make economic and reliability comparisons of the various systems and the various ways of obtaining reheat, and to determine more precisely those factors which affect the need for reheat, whether reheat is required under all combinations of these factors, and whether some types of FGD systems may have inherent advantages over others.

A competitive RFP has been prepared to conduct approximately a fourteen month study to answer these objectives. The contractor will survey utilities, vendors, and other organizations with FGD expertise regarding stack gas reheat. Economic and reliability comparisons will be made among the various systems for obtaining reheat for FGD systems, and the degree of reheat required by FGD systems will be determined. Seven proposals have been received in response to the RFP and are presently being evaluated to select a contractor.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 9/26/76

EPA OFFICE USE ONLY

[illegible]	[illegible] 11P-1	PROJECT OFFICER John E. Williams RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y. 76	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

EPA Form 5760-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

FB [illegible]

TITLE OF PROJECT: Experimental and Theoretical Studies of Solid Solution Formation in Lime/Limestone Scrubbing

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND/OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Benjamin F. Jones Scientist	Frank B. Meserole Department Head, Inorganic Chemistry	Philip S. Lowell Principal Scientist

NAME AND ADDRESS OF APPLICANT INSTITUTION

Radian Corporation, 8500 Shoal Creek Blvd., Austin, TX 78766

SUMMARY OF PROPOSED WORK [illegible]

Objectives:

Develop experimental techniques which can be used to identify, characterize and measure the solid solution formed by calcium sulfate and calcium sulfite. Develop a theoretical framework for liquid-solid equilibrium (or kinetics) that can be used for predicting the conditions necessary for unsaturated operation of lime and limestone SO_2 scrubbers at given levels of chloride and oxidation.

Approach:

A bench scale reactor is used to mix a limestone slurry with solutions containing sulfate and sulfite in varying concentrations. The sulfate composition of the solids precipitated from solutions subsaturated with respect to $CaSO_4 \cdot 2H_2O$ are measured as a function of temperature, precipitation rate, sulfate ion concentration and magnesium concentration. The results will be compared to that obtained without limestone (precipitation from clear solutions) to determine the effect of local concentration gradients surrounding dissolving limestone particles.

Plans:

Project completed May 12, 1976. Final report to be issued in October 1976.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (if any)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD (check one) [illegible] X [illegible]	FILE NO. [illegible]	PROJECT OFFICER Robert H. Borgwardt [illegible] IERL/RTP	
FUNDS OBLIGATED 30,000	F.Y. 76	[illegible] 0	STARTING DATE May 12, 1975	ESTIMATED COMPLETION DATE May 12, 1976

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. (Do not use this space)

SSIE

[illegible]

TITLE OF PROJECT

Shawnee Full-Scale Study of Lime/Limestone Scrubbing--Advanced Testing and Data Evaluation

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Air Quality Group of the Process Technology Department of Research & Engineering

G.H. Dyer - Dept. Mgr.	H.N. Head - Project Mgr.	S.C. Wang - Tech. Mgr.

R.M. Sherwin - Group Mgr.	D.T. Rabb - Site Mgr.	A. Abdulsattar - Asst. Site Mgr.

Telephone [illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

Bechtel Corporation - Research and Engineering
P. O. Box 3965
San Francisco, CA 94119

SUMMARY OF PROPOSED WORK [illegible]

Based on earlier testing at Shawnee and in the EPA pilot plant, Bechtel is conducting an advanced test program at Shawnee to supply information and optimize lime and limestone scrubbing systems in the areas of: improving sludge disposal properties, improved system control and reliability, variable load operation, and improved process economics. A two year advanced test program on two scrubber systems was planned to study these advanced test concepts. However, concurrent testing in the EPA pilot plant, and subsequent testing at Shawnee have indicated that further study of some of the advanced test concepts offer even greater potential for improvement than was originally thought. Of particular significance is the staged scrubber operation developed in the EPA pilot plant, in which both high alkali utilization and high oxidation of sulfite to sulfate is obtained. Successful application on a larger scale of these operating concepts could favorably affect both the economics of scrubbing and the quantity and quality of the sludge produced. Furthermore, alkali utilization studies have shown a correlation between alkali utilization and the accumulation of mud-type solids. With high alkali utilization, accumulation of the mud-type solids is dramatically reduced, eliminating many of the persistent reliability problems, especially in the mist eliminator area. Based on these recent test results, the advanced test program was extended to provide adequate time to further study these important concepts. Operation through calendar year 1977 is now anticipated.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 9/26/76

FOR OFFICE USE ONLY

SUPPORT METHOD ☒ [illegible]	ROAP NO. 1-(P-11)/1	PROJECT OFFICER John E. Williams ORGANIZATION IERL-RTP

FUNDING AMOUNT	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$[illegible]	76		7/1/76	12/31/77

EPA Form 5700-1 (7-75)	REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

SSIE PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

FO [illegible]

TITLE OF PROJECT:
Louisville Gas & Electric Full-Scale Scrubber Testing & Waste Disposal Program

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Robert P. Van Ness
Manager, Environmental Affairs

NAME AND ADDRESS OF APPLICANT INSTITUTION

Louisville Gas & Electric Company
P. O. Box 354
Louisville, KY 40201

SUMMARY OF PROPOSED WORK — [illegible]

Project Objectives:

(a) To characterize the performance, reliability, and chemistry of the LG&E lime scrubbing system installed at Paddy's Run Unit No. 6.

(b) To increase the understanding of the LG&E system and to broaden its applicability to other power plant SO_2 scrubbing applications, with emphasis on unsaturated (in gypsum) operation.

(c) To evaluate scrubber waste disposal options, with emphasis on methods not currently offered commercially.

Project Approach:

Conduct a 6-month scrubber test program, including tests involving use of carbide lime, use of commercial lime, variation in reaction tank configuration/operation, and addition of chloride (and probably magnesium). Waste from the carbide lime and commercial lime tests will be used in several waste/ash/chemical additive mixtures; the mixtures will be placed in field test disposal sites for an evaluation period of about 12 months.

NOTE: FY 1976 funding allowed extension of the scrubber test program from 3 months to 6 months.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (e.g., MEDICAL, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one)	TASK NO.	PROJECT OFFICER
☐ EPA STAFF (In-house) ☐ [illegible] ☒ [illegible] ☐ RESEARCH GRANT	1(P-1)/8	Julian W. Jones EPA/ORD/OFFICE ORGANIZATION IERL-RTP [illegible]

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$100,000	76	None	5/1/76	12/31/77

EPA Form 1700-1 (7-73)   SUPERSEDES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

EPA

[illegible]

TITLE OF PROJECT

Engineering & Analytical Support for the Louisville Gas & Electric Scrubber Test Program

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Mr. R. H. Wells
Program Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

Radian Corporation
P. O. Box 9948
Austin, TX 78766

SUMMARY OF PROPOSED WORK [illegible]

Project Objective:

To provide engineering and analytical support necessary to successfully perform a series of lime scrubbing tests on the flue gas desulfurization system at Louisville Gas & Electric's Paddy's Run Unit No. 6. These tests will be performed to increase the understanding of the LG&E system and to broaden its applicability to other power plant SO_2 scrubbing applications, with emphasis on unsaturated (in gypsum) operation.

Project Approach:

(a) Prepare a detailed plan for a test program designed to characterize the performance, reliability, and chemistry of the LG&E lime scrubbing system installed at Paddy's Run Unit No. 6.

(b) Provide engineering and analytical support for a 6-month scrubber test program, which will include tests involving use of carbide lime, commercial lime, variation in reaction tank configuration/operation, and addition of chloride (and probably magnesium).

(c) Characterize, using the test data, important chemical reactions taking place in various system streams and vessels; to relate these reactions to basic design and operating parameters of lime scrubbing systems so that performance of the LG&E system will be generally applicable.

NOTE: FY 1976 funding allowed extension of the test program from 3 months to 6 months.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF APPLICABLE)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ [illegible] ☒ [illegible] ☐ [illegible]	TASK NO. 1(P-1)/8	PROJECT OFFICER Julian W. Jones RESPONSIBLE ORGANIZATION IERL-RTP UIPD-SSTB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$80,000	76	None	6/1/75	6/1/77

EPA Form 5700 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

EPA

78,000

TITLE OF PROJECT

Test Program for the Full-Scale Double Alkali FGD Utility Demonstration

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ANY PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

RFP No. DU-78-A-156

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK — [illegible]

Objective:

This program will provide for the development and implementation of a test program to fully characterize, study, optimize, and demonstrate operation of the double alkali FGD system on a full-scale coal-fired utility boiler.

Approach:

The contractor to be selected will plan and conduct a test program for evaluation of the 280 MW double alkali FGD system to be installed at Louisville G&E's Cane Run No. 6 boiler. The testing will include baseline tests, acceptance tests, and long term operation and optimization tests. Tests will be conducted to measure and analyze particulate matter emissions (including organics and elemental analysis), gaseous emissions (including SO_2, NO_x, organics and elemental analysis) and solid waste product. The tests will also be designed to evaluate system performance including: SO_2 removal, particulate removal, sulfate precipitation, oxidation, and consumption of chemicals and energy. The contractor will also report on process reliability and economics.

Current Plans:

Proposals received in response to an RFP are being evaluated to select the contractor. Once a contract has been signed the contractor will begin familiarization with the system.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		22 September 197

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SUPPORT METHOD	ROAP NO.	PROJECT OFFICER
AGENCY STAFF (in-house)	1(p-1)/7	Norman Kaplan
X COOPERATIVE CONTRACT		ORGANIZATIONAL IDENTIFICATION
RESEARCH GRANT		IERL-RTP

FUNDS OBLIGATED	F.Y.	NO. OF FISCAL YEARS (Estimated) REMAINING	STARTING DATE	ESTIMATED COMPLETION DATE
	78	3	Dec. 1978 (Estimated)	1980

EPA Form 5760-1 (2-73) REPLACES EPA FORM 160 AND SSIE 166 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

[illegible]

TITLE OF PROJECT

Advanced Regenerable Flue Gas Desulfurization Demonstration

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N/A Transaction Incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To Be Selected

SUMMARY OF PROPOSED WORK [illegible]

As part of the demonstration program carried out under provisions of the Clean Air Act Amendments of 1970, EPA has undertaken the demonstration of several flue gas desulfurization (FGD) processes on a scale that approximates a single train of a full scale, multi-train, commercial installation. The accelerated energy-related program within EPA includes funds for an advanced FGD demonstration system. It is intended that the system produce elemental sulfur as its primary product, be capable of high SO_2 removal efficiencies, and utilize a reductant material other than natural gas.

The purpose of this effort is to provide for the demonstration of an advanced flue gas desulfurization process having significant advantages over currently available technology. The system to be provided will be capable of producing elemental sulfur, be capable of high SO_2 removal efficiencies, and utilize reductants other than natural gas.

Program Element [illegible]

IDENTIFY PROFESSIONAL SCHOOL INVOLVED

N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

TASK NO.
21F-21/4

PROJECT OFFICER (919) 549-8411, Ext 2915
C. J. Chatlynne FTS 629-2915
[illegible]
[illegible]
Res. Tri. Park, N.C. 27711

FUNDS OBLIGATED FY
76

ESTIMATED COMPLETION DATE
3/78

EPA Form 5760-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT

Catalytic Reduction of Nitrogen Oxides with Ammonia: Utility Pilot Plant Operation

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Jules H. Kline
Paul H. Owen
Y.C. Lee

NAME AND ADDRESS OF APPLICANT INSTITUTION

Environics, Inc.
4101 Westerly Place, Suite 107
Newport Beach, CA 92660

SUMMARY OF PROPOSED WORK [illegible]

The objective of the 1976 funding on this contract is to enable completion of the final report and site restoration.

The work under this contract was performed to demonstrate on a pilot plant scale the performance, reliability and practicability of reducing emissions of nitrogen oxides in flue gas from gas and oil-fired steam boilers by reduction with ammonia over a platinum catalyst.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

N.A.

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

[illegible]

2(P-2)/5

PROJECT OFFICER (919)-549-8411, Ext 2915
R.D. Stern [illegible] 629-2915
[illegible]
Res.Tri. Pk, N.C. 27711

FUNDS OBLIGATED: $10,000

F.Y.: 76

STARTING DATE: 06/17/76

ESTIMATED COMPLETION DATE: 10/18/76

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved [illegible] PROJECT NO. [illegible] 76 [illegible]

TITLE OF PROJECT

Magnesium Oxide Flue Gas Desulfurization Test Program

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THIS PROJECT.

N/A Transaction Incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

As part of the demonstration program carried out under provisions of the Clean Air Amendments of 1970, EPA has undertaken the demonstration of several flue gas desulfurization (FGD) processes on a scale that approximates a single train of a full-scale, multi-train, commercial installation. As the final step in the demonstration of the magnesium oxide FGD process, EPA will provide the services of an independent test contractor to perform a test and evaluation of an existing magnesium oxide FGD installation.

Program Element # EHB-524

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK [illegible] S(P-2)/6	PROJECT OFFICER (919) 549-8411, Ext 2915 [illegible] FTS: 629-2915 [illegible]		
FUND INDICATOR	F.Y. 76	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE 6/77

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible] PROJECT NO. [illegible] SIE ORB
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	76 CDD

TITLE OF PROJECT

Wellman-Lord/Allied Chemical Demonstration Test Program

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

R.C. Adams
Reginald Jordan

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRW, Inc.
[illegible] Follin Lane, S.E.
Vienna, VA 22180

SUMMARY OF PROPOSED WORK [illegible]

TRW, Inc. will furnish the necessary personnel, materials, services, equipment, and facilities necessary for or incident to the performance of the three major tasks described below:

1. Preparation of Demonstration Test Plan - TRW Inc. will prepare and submit for approval a Demonstration Test Plan based on the preliminary plans contained in Sections 4.1, 4.3, 4.5 and 4.6 of the Work Plan Manual - Test and Evaluation Program for the NIPSCO/DAVY/ALLIED Demonstration Plant, dated 31 August 1973. The Demonstration Test Plan will include a thorough discussion of test parameters, sampling methods, instrumentation, analytical methods, schedule, manpower, costs, data collection, reduction, and presentation. Installation and checkout of test measurements equipment, which was initiated under Task 1B of Contract No. 68-02-0238, will be continued during preparation of the Demonstration Test Plan.

2. Perform Acceptance Test - TRW Inc. will obtain acceptance test measurements during the one-year demonstration operation of the WELLMAN-LORD/ALLIED system at NIPSCO. The procedures, methods, schedules, etc., will be in accordance with the approved Acceptance Test Plan prepared during Task 1B to Contract No. 68-02-0238.

3. Perform One-Year Demonstration Test - TRW Inc. will obtain test measurements during the one year demonstration operation of the WELLMAN-LORD/ALLIED system at NIPSCO. The procedures, methods, schedules, etc. will be in accordance with the approved Demonstration Test Plan prepared during Task 1 of this contract. TRW Inc. will collect, reduce and evaluate demonstration data and prepare a report which will serve as a final report for the WELLMAN-LORD Demonstration Program.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N.A.	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ PROJECT STAFF (IN-HOUSE) ☒ SCIENTIFIC CONTRACT ☐ RESEARCH GRANT	TASK NO. [illegible]	PROJECT OFFICER Wade H. Ponder [illegible] [illegible] [illegible]

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$[illegible]	76		[illegible]/[illegible]/75	12/03/77

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R006

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

78 [illegible]

TITLE OF PROJECT

Advanced Regenerable Flue Gas Desulfurization Demonstration Test Program

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

N/A Transaction Incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To Be Selected

SUMMARY OF PROPOSED WORK — [illegible]

As part of the demonstration program carried out under provisions of the Clean Air Act Amendments of 1970, EPA has undertaken the demonstration of several flue gas desulfurization (FGD) processes on a scale that approximates a single train of a full scale, multi-train, commercial installation. The accelerated energy-related program within EPA includes funds for an advanced FGD demonstration system. It is intended that the system produce elemental sulfur as its primary product, be capable of high SO_2 removal efficiencies, and utilize a reductant material other than natural gas.

The purpose of this effort is to provide for a comprehensive Test and Evaluation Program in conjunction with the demonstration of an advanced flue gas desulfurization process having significant advantages over currently available technology. The system to be provided will be capable of producing elemental sulfur, be capable of high SO_2 removal efficiencies, and utilize reductants other than natural gas. The test and evaluation program will also include baseline and acceptance testing.

Program Element [illegible]

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

SUPPORT METHOD [illegible] X	TASK NO. [illegible]	PROJECT OFFICER [illegible]	(919) 549-8411, Ext 2915 FTS: 629-2915 Res. Tri. Park, N.C. 27711

FUNDS OBLIGATED $310,000	F.Y. 78	[illegible]	STARTING DATE [illegible]	ESTIMATED COMPLETION DATE [illegible]

EPA Form 5700-1 (3-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

CDD

TITLE OF PROJECT

NOVEL DEVICES AND SCRUBBER CONTROL TECHNOLOGY TRANSFER

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: Dr. Richard Parker, Environmental Engineer
Engineers: Dr. Seymour Calvert, President
Mr. Ronald Patterson, Environmental Engineer
Mr. Shui-Chow Yung, Environmental Engineer
Mr. Harry Barbarika, Environmental Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Air Pollution Technology, Inc.
4901 Morena Blvd., Suite 402
San Diego, CA 92117

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

The objective of this project is to conduct two technology transfer conferences dealing with novel device and scrubber control technology. In addition, the symposium proceedings will be compiled and printed, two draft capsule reports will be written, and six executive summaries will be prepared and compiled into a report.

Current plans are to hold the first conference in the eastern U.S. during the Spring of 1977. The second conference will be in the western U.S. during the Autumn or Winter of 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10-8-76

EPA OFFICE USE ONLY

SUPPORT METHOD (Check one)
[illegible]
X [illegible]
[illegible]

TASK NO. 1

PROJECT OFFICER
Richard Stern

RESPONSIBLE ORGANIZATION
EPA, IERL, Research Triangle Park, NC

FUNDS OBLIGATED 66,050

F.Y. 76

[illegible]

EFFECTIVE DATE 9/21/76

ESTIMATED COMPLETION DATE 3/26/78

EPA Form 5700-1 (7-73) REPLACES PHS FORM 115 AND SIE 105 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

DEWATERING PRINCIPLES AND EQUIPMENT DESIGN STUDIES

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT: Dr. Arthur R. Tarrer, Principal Investigator and Assistant Professor; Dr. James A. Guin, Associate Professor; Dr. John W. Prather, II, Research Associate; Dr. Lee J. Hirth, Associate Professor, all in Department of Chemical Engineering; Dr. Donald Vives, Associate Professor and Acting Head of Department of Chemical Engineering; and Professor James C. Warman, Pro... Manager and Director, Water Resources Research Institute.

NAME AND ADDRESS OF CONTRACT INSTITUTION

Auburn University
Water Resources Research Institute
[illegible] Hall, Auburn, AL 36830

SUMMARY OF PROPOSED WORK – [illegible]

The objective is to develop more economically feasible methods than those currently available for continuous treatment of flue gas cleaning (FGC) wastes. Initial efforts are to be concentrated on applying gravity sedimentation to rapidly, inexpensively dewater FGC wastes. The approach will be to: Develop methods for characterizing the physical properties and behavior of FGC wastes. Develop procedures based on the models proposed herein to allow accurate design and analysis of gravity sedimentation units used in treating FGC wastes. Perform bench scale and pilot tests to evaluate the feasibility of using gravity sedimentation units for treating FGC wastes. Perform developmental studies to determine the best design for channel promoters. Bench scale and continuous pilot tests are to be performed to evaluate the feasibility of such devices for improving dewatering efficiency while treating FGC wastes. Assess filterability of different types of FGC sludges dewatered to different degrees and pumping requirements for the different sludges.

Duration: May 1976 - July 1978

Key Terms: SO_2 abatement, flue-gas treatment, gravity sedimentation, scrubber-sludge dewatering, thickener design and analysis, filtration, promoted agglomeration, accelerated gravity settling.

SPECIALTY & PROFESSIONAL SCHOOL INVOLVED (If Any) Engineering	SIGNATURE OF PRINCIPAL INVESTIGATOR Arthur R. Tarrer	DATE February 10, 1976

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO. 5	PROJECT OFFICER: Julian W. Jones	
		RESPONSIBLE ORGANIZATION IERL, RTP, NC (919)549-8411 X 2915	
75,000		STARTING DATE 06/01/76	ESTIMATED COMPLETION [illegible]/31/78

EPA Form 5700-1 ([illegible]) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Disposal/Utilization of FGC By-Products: Technology Assessment & Transfer

NAMES, DEGREES, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N/A - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Project Objectives:

To assess results of EPA, TVA, and private industry R&D efforts in the areas of flue gas cleaning waste disposal/utilization and power plant water use, and to transfer this assessment to the general public.

Project Approach:

(a) Assemble, assess and report EPA, TVA and private industry R&D results in the areas of FGC waste disposal/utilization and power plant water use. Reporting shall consist of formal briefings or presentations, capsule reports, and annual integrated assessment reports.

(b) Support the assessment through review of environmental regulations and cost information.

(c) Support the assessment through physical/chemical tests on up to six (6) FGC wastes.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (if any)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

X [illegible]

TASK NO.

5(P-5)

PROJECT OFFICER

Julian W. Jones

RESPONSIBLE ORGANIZATION

IERL-RTP, [illegible]

FUNDS OBLIGATED

F.Y. 78

NO. OF FUTURE YEARS [illegible]

unknown

STARTING DATE

N/A

ESTIMATED COMPLETION DATE

N/A

EPA Form 5700-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

[illegible]

78 CDD

TITLE OF PROJECT
Study to Determine the Feasibility of Using FGD Sludge Gypsum in Portland Cement

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

N/A - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Project Objective:

To determine the technical and economic feasibility of using FGD sludge gypsum in portland cement manufacture under U.S. plant operating and marketing conditions.

Project Approach:

(a) Conduct a preliminary market survey to determine the extent to which FGD gypsum could be used in the portland cement industry

(b) Conduct a series of laboratory tests to identify and solve problems associated with chemical and/or physical characteristics of FGD gypsum in order for the gypsum to be used in portland cement manufacture

(c) Design and estimate costs of a pilot demonstration unit

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]	TASK NO. [illegible]		PROJECT OFFICER Julian W. Jones ORGANIZATIONAL IDENTIFICATION IERL/RTP [illegible]	
FUNDS OBLIGATED	F.Y. 78	NO. OF [illegible] unknown	STARTING DATE N/A	EXPECTED COMPLETION DATE N/A

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT F-2	Form Approved [illegible] PROJECT NO. [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	18CDD

TITLE OF PROJECT

Dewatering Principles and Equipment Design Studies

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Prof. James C. Warman
Director
Dr. A.R. Tarrer
Principal Investigator

NAME AND ADDRESS OF APPLICANT INSTITUTION

Auburn University
Water Resources Research Institute
203 Samford Hall
Auburn, AL [illegible]

[illegible]

Project Objectives:

(a) To relate FGD waste physical properties to performance of dewatering equipment

(b) To develop improved dewatering equipment designs

Project Approach:

(a) Examine the applicability of current dewatering equipment designs

(b) Conduct laboratory tests (e.g., settling tests) to determine FGD waste properties for design studies

(c) Conduct analytical modeling studies and laboratory dewatering equipment (e.g., clarifier, rotary drum vacuum filter, filter press) tests to develop improved equipment designs

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]		SIGNATURE OF PRINCIPAL INVESTIGATOR		DATE
EPA OFFICE USE ONLY				
[illegible]	[illegible] 8(P-3)	PROJECT OFFICER Julian W. Jones IERL-RTP [illegible]		
FUNDS OBLIGATED $75,000	F.Y. 76	[illegible] EHE	STARTING DATE 6/1/76	ESTIMATED COMPLETION DATE 5/31/78

EPA Form [illegible] REPLACES [illegible]

☆ U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT F-1

PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

76 [illegible]

TITLE OF PROJECT
Study of Disposal of By-products from Non-Regenerable FGD Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Mr. Jerome Rossoff
Director

NAME AND ADDRESS OF APPLICANT INSTITUTION
The Aerospace Corporation   P. O. Box 92957
Office of Stationary Systems   Los Angeles, CA 90009

SUMMARY OF PROPOSED WORK – [illegible]

Project Objectives:

(a) To identify environmental problems associated with FGD waste disposal
(b) To assess current FGD waste disposal methods
(c) To recommend alternate disposal approaches based on (a) and (b)
(d) To assess and report all FGD waste-related R&D

Project Approach:

(a) Compare chemical and physical characteristics of the wastes with current, proposed, or potentially applicable environmental standards
(b) Assess feasibility, performance and costs of disposal methods by measuring physical/chemical properties of wastes, by providing engineering/analytical support for a field disposal operation at TVA's Shawnee plant; evaluating other field data, and conducting engineering cost studies.
(c) Make recommendations regarding alternate disposal approaches.
(d) Assemble, assess and report, on an annual basis, all EPA, TVA, and private industry R&D in the FGD waste area

NOTE: FY 76 funding extends support of field disposal operation at Shawnee through 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	ROAP NO.	PROJECT OFFICER
[illegible]	[illegible]	Julian W. Jones
		RESPONSIBLE ORGANIZATION
		IERL-RTP [illegible]

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
NA – transportation Amendments	76	unknown	11/25/75	9/26/77

EPA Form 1720-1 (7-75)   REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT F-5 PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. 158-R0081 PROJECT NO. (Do not use this space) ROAP 78 CDD

TITLE OF PROJECT

Lime/Limestone Scrubbing Sludge Conversion Pilot Studies

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N/A - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Program Objective:

To develop, through pilot-scale testing, a process for converting lime/limestone scrubbing sludge to elemental sulfur with recovery of calcium as $CaCO_3$.

Program Approach:

(1) Conduct pilot studies of

(a) Reduction of lime/limestone sludge to CaS (in a kiln)

(b) Dissolution of CaS to $Ca(HS)_2$ (in a gas-liquid contactor)

(c) Recovery of Ca as $CaCO_3$, with release of H_2S for conversion to elemental sulfur (in a gas-liquid contactor)

(2) Develop preliminary design for larger scale demonstration unit based on pilot data

NOTE: 1976 Funding will complete incremental funding for this project, which will be cost-shared with the contractor

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (check one) X [illegible]	TYPE NO. S/P-8)/7	PROJECT OFFICER Julian W. Jones RESPONSIBLE ORGANIZATION IERL-RTP UTPD-ESTB

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
	76	unknown	N/A	N/A

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

EPA 78 ODD

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

Evaluation of Alternatives for Disposal of FGD Sludges

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Richard R. Lunt
Project Director

NAME AND ADDRESS OF APPLICANT INSTITUTION

Arthur D. Little, Inc.
Acorn Park
Cambridge, MA 02140

SUMMARY OF PROPOSED WORK [illegible]

Project Objectives:

To identify and assess alternate disposal methods for flue gas desulfurization wastes and, if viable, to demonstrate at least one mine disposal and one ocean disposal alternative.

Project Approach:

(a) Conduct a preliminary evaluation/assessment of the environmental, technological, economic, and legal aspects of mine, ocean, and other FGD waste disposal options (other than ponding and landfilling) to identify promising alternatives for further study.

(b) Conduct a refined evaluation/assessment, including laboratory experiments as required, of the environmental, technological, and legal aspects of several mine and ocean alternatives to recommend viable alternatives for demonstration (not included in original contract).

(c) Demonstrate, on a pilot scale, at least one mine disposal method and one ocean disposal method, to obtain operational, economic, and design data for full-scale systems.

NOTE: FY 78 funds used to complete supplemental funding on original contract ($45,800) and to fund contract modification for refined evaluation/assessment and engineering design cost study ($131,700).

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]	TASK NO. 4(P-3)/5	PROJECT OFFICER Julian W. Jones ORGANIZATION IDENTIFICATION IERL/RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$131,700	78	Unknown	7/10/75	9/15/78

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

78 CDD

TITLE OF PROJECT

Environmental Assessment of Stationary Source NO_x Control Technologies

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

R. M. Kendall - Chief Scientist - Program Manager
W. H. Nurick - Technology Directorate - Deputy Program Manager
H. B. Mason - Technology Directorate - Chief Project Engineer
G. R. Offen - Technology Directorate - Project Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Acurex Corporation/Aerotherm Division
485 Clyde Avenue
Mountain View, California 94042

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this 3-year systems study are to (1) identify the multi-media environmental impact of stationary combustion sources and NO_x combustion modification controls and (2) identify the most cost effective combustion modification approach (es) to achieving and maintaining air quality for NO_2. The results of this study will guide the development and subsequent implementation of environmentally sound NO_x control techniques. Detailed process engineering and multimedia impact studies will be made of the application of commercial heating systems, stationary engines and industrial process furnaces as well as of alternate concepts such as the use of catalytic combustion or of clean fuels. Control of NO_x emissions by combustion process modification will be emphasized for near-term application. The combination of combustion modification with post-combustion flue gas treatment will be considered for application in the post-1980 period.

The initial effort, in progress, is to generate a comprehensive inventory and projection of gaseous, liquid and solid effluents for both controlled and uncontrolled sources. The environmental stresses of the sources and control systems will be evaluated according to pollutant transport and transformation and ultimate receptor impact. Field emission tests will be made to augment the existing data base. Process studies will yield data on control effectiveness, energy efficiency, cost and differential trace emissions for current and emerging control systems. The study will culminate with a system analysis which will integrate the process engineering and environmental impact results to determine the optimum combination of the control systems under consideration, on a regional basis, to comply with NO_2 air quality standards.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	FILE NO.	PROJECT OFFICER
3 [illegible]	6(P-7)	Joshua S. Bowen IERL-RTP, EACD, CRB

FUNDS ALLOCATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$880,240	76		6/18/76	6/79

EPA Form 5700-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
	PROJECT NO. (Do not use this space)
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	78 CODD

TITLE OF PROJECT

Analysis of NO_x Control in Stationary Sources

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Owen W. Dykema
Manager, Combustion Effects

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Aerospace Corp.
2350 East El Segundo Blvd.
El Segundo, Calif. 90245

SUMMARY OF PROPOSED WORK – [illegible]

Under ongoing programs NO_x emissions from gas-fired boilers at full load have been reduced by as much as 61 percent, or as little as 37 percent depending on size, configuration, and operating characteristics of the unit. Reduction for oil and coal-fired boilers range from 60 to 30 percent, and 60 to 20 percent, respectively. Although these reductions are significant, they do not necessarily represent the maximum, practical attainable values. In application of combustion modification techniques where NO_x reductions were achieved, the degree of reduction has been limited by the excessive emission of CO or smoke, or the occurrence of combustion instability or flame lift-off. By relieving these problems by several proposed methods further reduction in NO_x could be achieved.

This research grant includes three sub-tasks involved in the general investigation of practical methods to reduce NO_x emissions in utility boilers; namely, (1) combustion and flame stability, (2) effects of combustion modification on plant efficiency, and (3) effect of combustion modifications on tangential oil-fired boilers, and two sub-tasks in the continuing compilation and up-date of the emissions inventory; namely, (1) utility and industrial boiler data up-date, and (2) addition of other major point source categories. In this third year's effort, the emphasis will be on two major tasks: (1) NO_x control, in which three previously developed models will be improved, simplified, and incorporated into one model; (2) the up-date of the emissions inventory of NO_x, CO, HC and particulate will be completed with the compilation of data for the stationary sources associated with (a) mineral products, (b) secondary metals, and (c) wood products.

[illegible] N.A.	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☐ [illegible] ☐ [illegible] ☒ [illegible]	TASK ID 6(P-7)/4	PROJECT OFFICER Robert E. Hall RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CPB		
FUNDS OBLIGATED $112,308	FY 76	[illegible] None	STARTING DATE 07/15/76	ESTIMATED COMPLETION DATE 07/14/77

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

75 GDD

TITLE OF PROJECT: Evaluation of Emissions from Residential and Small Commercial Stoker Coal-Fired Boilers Under Smokeless Operations

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

R. D. Giammar, Principle Investigator
A. E. Barrett, Associate Manager, Fuels and Combustion Systems Department
H. W. Engdahl, H. R. Hazard, R. T. Reid, Advisors

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Columbus Laboratories, 505 King Avenue, Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

OBJECTIVES: The objectives of this program are (1) to evaluate emissions from residential and small commercial stoker-fired boilers under typical boiler operation, including smokeless operation, and (2) to assess the advisability of increased utilization of coal for those applications.

APPROACH: This program consists of nine tasks designed to evaluate emissions, including POM, from the small stoker boiler firing anthracite, bituminous, Western, and "smokeless" coal for several operating cycles. In addition to the experimental aspects, survey to evaluate small commercially available stokers and to evaluate the manufacturing process for smokeless coal will be conducted. From the results of the experimental program and the findings of the survey, a program will be recommended to increase the environmental acceptability and to improve the economics of residential and small commercial stoker boilers.

CURRENT PLANS: Project work was started on November 1, 1974, and is expected to be completed by September 31, 1975.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	TASK NO 7(P-B)/9	PROJECT OFFICER J. H. Rogers RESPONSIBLE ORGANIZATION IERL-RTP, RACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	EXPECTED COMPLETION DATE
$84,933	75	0	11/74	9/75

EPA Form 5760-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

78 CDD

TITLE OF PROJECT

INVESTIGATION OF AERODYNAMIC PHENOMENA in Pollution Control

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Louis J. Spadaccini - Combustion Technology
Dr. Craig T. Bowman - Environmental Sciences
Mr. Henry McDonald - Chief Gas Dynamics

NAME AND ADDRESS OF APPLICANT INSTITUTION

United Aircraft Corporation Research Laboratories
400 Main Street
East Hartford, Connecticut 06108

SUMMARY OF PROPOSED WORK [illegible]

This document has been prepared in response to a Request for Proposal, DU-75-A066, from the U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. The research program will investigate aerodynamic phenomena in the control of pollutants from gaseous and heterogeneous combustion. The program has four primary objectives:

(1) To utilize recently developed optical and probing techniques to obtain detailed information on the chemical and physical processes occuring inside a combustor operating on gaseous and liquid fuels.

(2) To compare experimental observations with results from a combustor flow analysis (PREP code) to further evaluate the theoretical model.

(3) To further develop the combustor flow analysis for predicting the physical and chemical processes occuring in combustors operating on gaseous and liquid fuels.

(4) To utilize information obtained from the experimental and theoretical investigation to evaluate potential emission control strategies for gaseous and liquid fuel combustors.

IDENTIFY PROFESSIONAL GROUPS INVOLVED IN STUDY N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	TASK NO. 7(P-6)/3	PROJECT OFFICER W. S. Lanier [illegible] IERL-RTP, CACD, CRB

FUNDS OBLIGATED $88,865	F.Y. 76	[illegible] 1	STARTING DATE 5/31/76	ESTIMATED COMPLETION DATE 5/31/77

EPA Form 5700-1 (8-75) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

☆ U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

78 C [illegible]

TITLE OF PROJECT
Evaluation of Emissions and Control Technology for Industrial Stoker Boilers

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

This program will characterize the spectrum of emissions from industrial coal-fired stoker boilers and will investigate control methods to reduce these emissions. Initial effort will be directed at evaluation of emissions from a small-scale stoker firing untreated, reconstituted, and processed coals. An experimental program will be conducted with these coals and a comprehensive analysis made to evaluate the potential for emissions control.

The program will continue with the contractor preparing a full scale industrial stoker boiler (25,000lbs steam p/hour) for control modification studies and fuel testing. A test program to evaluate the emissions reduction for several modifications will be conducted including comprehensive sampling and analysis for a complete determination of pollutant emissions. An assessment of the environmental impact of the new technology will be made to determine the future acceptability of stoker boilers

IDENTIFY [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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[illegible] 3

TASK NO.
T(P-D)/6

PROJECT OFFICER
J. H. Wasser

RESPONSIBLE ORGANIZATION
IERL-RTP, EACD, CRB

FUNDS OBLIGATED

F.Y.
78

[illegible]
3-year

STARTING DATE
10/78

ESTIMATED COMPLETION DATE
1/79

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible] PROJECT NO. (DO NOT USE THIS SPACE)
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	EPA 78 [illegible]

TITLE OF PROJECT

Professional Services: Dr. Jumpei Ando

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Jumpei Ando

NAME AND ADDRESS OF APPLICANT INSTITUTION

Dr. Jumpei Ando
Chuo University, Faculty of Science & Engineering
Kasuga Bunkyo-Ku Tokyo, JAPAN

SUMMARY OF PROPOSED WORK [illegible]

Dr. Ando is to
(1) Provide up-to-date status reports and technical and economic evaluations concerning new Japanese pollution control technologies; and
(2) Assist in relating the Japanese data, cost, and experience to the U.S. situation; and
(3) Assist in evaluation of technical proposals submitted to the EPA where knowledge of Japanese Technology is pertinent to the project; and
(4) Assist in EPA's activities as part of the 1975 U.S. - Japan Environmental Agreement.

Program Element [illegible]
Contract #68-02-2161

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	FILE NO. 8(P-9)/6	PROJECT OFFICER (919) 549-8411, Ext 2915 [illegible]

FUNDS OBLIGATED $30,000	F.Y. 76	[illegible]	STARTING DATE 06/25/76	ESTIMATED COMPLETION DATE 06/78

EPA Form 5700-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0062

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT: Processes for the Treatment of Combustion Flue Gas for (1) Removal of NO_x and (2) Simultaneous Removal of NO_x and SO_x

N/A Transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To Be Selected

SUMMARY OF PROPOSED WORK

(1) The work to be performed under this contract(s) shall be the design, procurement, erection and test operation of pilot plants for (1) removal of NO_x and (2) simultaneous removal of SO_x and NO_x from combustion flue gas. The pilot plant shall treat a flue gas volume of at least the equivalent of .5 MW with a NO_x concentration of not less than 400 ppm. The pilot plant shall be designed for 90% of the incoming NO_x to be removed and it is desirable that 90% of the incoming SO_x be removed for simultaneous NO_x/SO_x processes. Coal is strongly preferred as fuel for the host boiler.

(2) Two contracts for pilot plant erection and operation are contemplated. One pilot plant will be for only NO_x removal with either high or low SO_x concentrations. The other pilot plant will be for simultaneous removal of SO_x and NO_x.

(3) The Commerce Business Daily advertisement for this procurement was published 08/03/76. Proposals are due on 11/30/76. Award is anticipated by 05/77.

Program Element #EHE624

N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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☒	RIP-01/7	PROJECT OFFICER (919) 549-8411, Ext 2915 J. David Mobley RTP, N.C. 27711
	76	STARTING DATE 6/77
		ESTIMATED COMPLETION DATE 6/78

U.S. ENVIRONMENTAL PROTECTION AGENCY

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

78 CDD

TITLE OF PROJECT

High Velocity Fabric Filtration

NAMES, DEPARTMENTS, AND INSTITUTIONS OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Dr. Melvin W. First, Professor of Environmental Health Engineering,
Dr. David Leith, Assistant Professor of Environmental Health Engineering
Department of Environmental Health Sciences
Harvard School of Public Health, 665 Huntington Ave.
Boston, MA 02115

NAME AND ADDRESS OF GRANTEE INSTITUTION

President and Fellows of Harvard College
Holyoke Center 461, 1350 Massachusetts Ave.
Cambridge, MA 02138

SUMMARY OF PROPOSED WORK [illegible]

If fabric filters can be made to operate at higher than conventional velocity, a proportional reduction in filter size and initial cost will be possible, making these efficient collectors attractive for many applications where they are not currently used. For example, a high velocity filter operating at a superficial filtration velocity of 25 cm/s (air to cloth ratio of 50 cfm/ft²) need be only 10 to 25 per cent as large as a unit operating at conventional velocities.

The objectives of the proposed work are: 1) to study the practicality of high velocity fabric filtration, 2) to investigate phenomena which limit effective high velocity operation, and 3) to develop models to interpret and predict fabric filter performance. To achieve these objectives, we will study pulse-jet cleaning at high velocity, the collection efficiency of filters at high velocity, penetration mechanisms which operate, and we will develop models to describe the performance of high velocity filtration systems.

Fabric filters are the most efficient of industrial dust collectors for fine particle emissions and yet their operation is poorly understood. An understanding of the means by which particles pass through, collect in, and are cleaned from a fabric filter is essential if high velocity filtration technology is to proceed rationally and if successful models for predicting filter performance at high as well as conventional velocity are to be developed.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (E.G., MEDICAL, ETC.) Public Health	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD (Check one) ☒ GRANT ☐ [illegible] ☐ [illegible] ☐ [illegible]	GRANT NO. [illegible]	PROJECT OFFICER J. H. Turner RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED $61,031	F.Y. 78	NO. OF MONTHS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

78 (738)

TITLE OF PROJECT

Electrostatic Effects in Fabric Filtration

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON THE PROJECT

Gaylord W. Penney, Principal Investigator
Edward R. Frederick, Co-investigator
Robert H. Lembach, Graduate Student
Brent Van Zandt, Technician
John Wieczorkowski, Technician
David Hickey, Technician

NAME AND ADDRESS OF APPLICANT INSTITUTION

Carnegie-Mellon University
Pittsburgh, Pa. 15213

SUMMARY OF PROPOSED WORK [illegible]

The electrostatic effects being studied can be divided into two classes: 1. The deposition of dust on the surface and 2. effects between fibers of a fabric. We have found that under the proper electrostatic conditions most of the dust can be deposited as a porous layer or filter cake thus giving a low-pressure drop filter. Conditions which maximize this effect are being studied. Almost all of this porous deposit is easily removed in the cleaning cycle. However the removal of dust during the cleaning cycle is not perfect. After long periods of operation a nonporous deposit of dust can form that is attached to fibers extending from the fabric. This can be difficult to remove and result in a high-pressure drop. The mechanism by which this nonporous, adherent, deposit forms and methods for its removal are being investigated. Other tests indicate that there can be significant electric fields between fibers of a fabric. The mechanism responsible for the fields and their significance are being investigated.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Electrical Engineering Department	SIGNATURE OF PRINCIPAL INVESTIGATOR Gaylord Penney	DATE 4/2/76

FOR OFFICE USE ONLY

SUPPORT METHOD ☐ [illegible] ☐ [illegible] ☐ [illegible] ☒ [illegible]		TASK NO. SIP: 101	PROJECT OFFICER J. H. Turner RESPONSIBLE ORGANIZATION RTP, N. C.	
FUNDS OBLIGATED $66,150	F.Y. 76	[illegible]	STARTING DATE 06/10/76	ESTIMATED COMPLETION DATE 10/79

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (Do not use this space) SSIE GPO 76 GDD

TITLE OF PROJECT

Fabric Filtration Measurements and Modeling Program

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Norman Surprenant - Project Director
Richard Dennis - Principal Investigator
Douglas Cooper - Principal Investigator
Robert Bradway - Principal Investigator
Reed Cass - Engineering Support

NAME AND ADDRESS OF APPLICANT INSTITUTION

GCA/Technology Division
Bedford, Massachusetts 01730

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this study is to characterize the performance of four different industrial fabric filter systems (two electric utility boilers at Sunbury, Pennsylvania, and Nucla, Colorado, an electric arc furnace and a municipal incinerator) and to use these data and laboratory generated data to develop mathematical models useful for the design of fabric filter systems. Of particular importance is the particulate removal efficiency of baghouses as a function of particle size. The fractional efficiency of fabric filters is determined by sampling with inertial and diffusional sizing techniques and the total mass efficiency is determined utilizing simultaneous upstream and downstream Method 5 techniques.

During the field evaluation tasks, certain baghouse and process operating parameters are also being changed to ascertain their effect, if any, in baghouse performance. Logs of all pertinent process and baghouse data are kept and feedstock and effluent samples are being analyzed so that uncontrollable variables can also be monitored.

The laboratory program is being conducted to provide additional data for the development and testing of predictive models of fabric filter behavior. Emphasis is being placed on the development of models for fabric filter systems used for the control of emissions from coal-fired utility boilers.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	[illegible] 6(P-10)	PROJECT OFFICER J. H. Turner [illegible] ORGANIZATION IERL-RTP
[illegible] $107,700 76	[illegible]	STARTING DATE 6/14/76

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT

Operating Procedures for Fine Particulate Control Equipment

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Richard Gerstle, Project Director
Timothy Devitt, Engineer
Norman Kulujian, Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

PEDCo-Environmental Specialists, Inc.
Suite 13, Atkinson Square
Cincinnati, Ohio 45246

SUMMARY OF PROPOSED WORK [illegible]

Objectives - Operating Procedures for fine particulate control equipment at coal fired power plants, at iron and steel and ferro-alloy plants, and at Kraft pulp mills and crushed stone operations.

Approach - Review current practices. Review design, startup and operating procedures. Review particulate collection efficiency. Establish operating procedures.

Current Plans - Work plan will be submitted within 30 days for approval by OBA.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Not Applicable	SIGNATURE OF PRINCIPAL INVESTIGATOR [illegible] Jutze, President	DATE July 7, 1976

FOR OFFICE USE ONLY

SUPPORT INSTRUMENT [illegible]	GRANT NO. [illegible]	PROJECT OFFICER D. C. Drehmel IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$100,000	76		6/8/76	6/78

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Fine Particulate Control with U.W. Electrostatic Scrubber

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Michael J. Pilat - Principal Investigator
Gary Raemhild

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Washington
Seattle, Washington 98195

SUMMARY OF PROPOSED WORK [illegible]

(1) The objective is to demonstrate a device for high efficiency collection of submicron-sized particulate matter from power plant and industrial plant effluent streams by use of charged droplet scrubbing.

(2) The approach is to design and build a mobile University of Washington Electrostatic Scrubber and use the unit on various sources to determine the total mass and fractional particulate collection efficiency under various process and device operating conditions. Preliminary designs and cost estimates of a larger University of Washington Electrostatic Scrubber system to control the emissions of fine particulates from at least one of the sources tested will be developed.

(3) Current plans are to complete the mobile unit and initiate testing.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Department of Civil Engineering	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO. 9(P-10)/3	PROJECT OFFICER Dale L. Harmon RESPONSIBLE ORGANIZATION IERL-RTP		
FUNDS OBLIGATED $ 74,4[illegible]	F.Y. 76	[illegible] 1	STARTING DATE 3/13/76	ESTIMATED COMPLETION DATE 3/14/78

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)
SSIE
EPA
76 [illegible]

TITLE OF PROJECT
Design and Construction of a Versatile Fabric Filter Test Unit

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT
Mr. F. E. Moreno, Engineering Systems Department; Manager, Environmental Engineering Programs/Mr. R. U. Fulton, Engineering Department; Staff Engineer/Mr. J. J. Reese, Engineering Department, Senior Project Engineer/ Mr. D. R. Glenn; Engineering Department; Leader – Systems Design Section.

NAME AND ADDRESS OF SUPPORTING INSTITUTION
Acurex Corporation/Aerotherm Division
485 Clyde Avenue
Mountain View, California 94042

[illegible]

(1) Objectives: To design, fabricate, install and test in the IERL Laboratory in Research Triangle Park, North Carolina, a versatile, high temperature (to 1000°F) fabric filter test unit which can control the gas composition, particulate loading and humidity of the inlet stream.

(2) Approach: A fabric filter test unit will be designed, fabricated and installed which will allow for the testing of four tubular (35 1/2" x 5" diameter) fabric filters in independent test chambers. Inlet particulate loading, temperature, gas composition, filter face velocity and humidity will be controlled by the unit. Additional instrumentation will be designed which will measure and log other parameters affecting filter life.

(3) Current Plans: A design will be generated during the initial 4 months of the contract. This design will be reviewed before parts procurement and fabrication begin. Partial fabrication of the test unit will be accomplished at Aerotherm (Mountain View, California) prior to the shipment of the device to the EPA in December 1976. Installation in the IERL laboratory is scheduled to begin in January 1977. Unit demonstration tests will be conducted in March 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE
1/27/76

FOR OFFICE USE ONLY

SUPPORT MECHANISM (Check one)
☐ [illegible]
☐ [illegible]
☒ [illegible]
☐ [illegible]

TASK NO.
5(P-101/6

PROJECT OFFICER
R. N. Dennis
RESPONSIBLE REPRESENTATIVE
IERL-RTP

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS TO BE INDEPENDENTLY FUNDED BEYOND CURRENT F.Y.	STARTING DATE	ESTIMATED COMPLETION DATE
$100,000	76		02/23/76	5/77

EPA Form 5760-1 (2-75) REPLACES PHS FORM 166 AND SSIE 166 WHICH MAY NOT BE USED.

☆ U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. [illegible] [illegible] 78 [illegible]

TITLE OF PROJECT: Baghouses as Emission Control Devices for a Solid Waste Incinerator/Boiler - A Pilot Plant Study

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

R. A. McDermott, Executive Vice President
J. D. McKenna, Vice President,
Enviro-Systems & Research Inc. (subcontractor)

NAME AND ADDRESS OF APPLICANT INSTITUTION

Nashville Thermal Transfer Corp.
110 First Avenue South,
Nashville, Tenn. 37201

SUMMARY OF PROPOSED WORK [illegible]

The purpose of the Grant is to quantitatively evaluate the performance of typical fabric filters operated in the pilot-scale baghouses already installed at the Nashville Thermal Transfer Corporation. The immediate goal is to identify optimum or near-optimum fabrics and filtering conditions for particulate removal from a slip-stream of the solid waste fired boilers operating at NTTC. Three different fabrics will be evaluated in the reverse air baghouse; one, in the pulse-jet baghouse. For each fabric and baghouse, mass and fractional efficiency of particulate collection will be determined. Efficiency measurements will be made at various air-to-cloth ratios as well as measurements of the pressure drops across the bags. From these field data cost estimates, both operating and annualized (operating costs plus depreciation of initial investment) of this control method for this type source will be prepared. Performance and cost comparisons will be made with the two major alternative control methods, electrostatic precipitators and wet scrubbers. Conclusions regarding the potential of baghouses for municipal incinerators will be prepared including recommendations for specific follow-on investigations if warranted.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	FILE NO. R(P-101)/6	PROJECT OFFICER J. H. Turner [illegible] 1001-BTP

[illegible] $83,000	[illegible] 76	[illegible]	STARTING DATE 9/76	[illegible] 10/78

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT

Mobile Bed Flux Force/Condensation Scrubbers

[illegible]

Project Director: Seymour Calvert, President

NAME AND ADDRESS OF APPLICANT INSTITUTION

Air Pollution Technology, Inc.
4901 Morena Blvd., Suite 402, San Diego, CA 92117

[illegible]

The main objective of this research project is to determine the feasibility of using mobile bed scrubber as a Flux Force/Condensation Scrubber. The scrubber will have a gas flow rate of 1,000 ACFM, or more and will include the following:

1. Preliminary tests of particle collection and entrainment characteristics in an existing mobile scrubber.
2. An experimental study of FF/C scrubbing in a revised pilot plant mobile bed scrubber. The experiments will provide data on the effects of such factors as number of mobile bed stages, condensation ratio, liquid to gas ratio, bed height, pressure drop, particle diameter, particle concentration, gas velocity, liquid entrainment, etc. on particle collection efficiency.
3. Development of mathematical models and design equations for mobile bed scrubbers.
4. Comparison of the mobile bed FF/C scrubber with spray and sieve FF/C scrubber.

Seymour Calvert 11/21/7

21P-101/8

D. L. Harmon
IERL-RTP

$101,999

76

6/18/76

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved OMB No. [illegible]	
PROJECT NO. (Do not use this space)	
[illegible]	76 CODE

TITLE OF PROJECT

Fabric Filter Analysis

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Forest Mixon - Project Director
Mr. R. P. Donovan - Principal Investigator

NAME AND ADDRESS OF APPLICANT INSTITUTION

Research Triangle Institute
P. O. Box 12194
Research Triangle Park, N. C. 27709

[illegible]

The purpose of these investigations is to report the potential value of various new fabrics as baghouse filters and to investigate basic aspects of the fabric filtration process. The information so generated is for both users and suppliers of fabric filters. The overall goal of the program is to achieve a more effective, lower cost method of controlling particulate emissions, especially fine particulates (diameter less than 3 μm).

The testing consists of simulating baghouse operation in one of three laboratory equipments: a shaker cleaned unit, a pulse-jet unit and a high temperature unit. The latter unit is being replaced by a unit of more versatile design, scheduled to become operational during the summer of 1977.

Topics investigated to date include assessment of the following fabrics: non-woven polyester, various needled felts, expanded polytetrafluoroethylene laminate and trade named fabrics. Both endurance and performance are determined. Special subjects research include: aging effects, bag cleaning technology, fabric surface finish effects and dust penetration studies. This work is being published as a series of reports under the general title EPA Fabric Filtration Studies.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) [illegible]	FILE NO. GIP-101/13		PROJECT OFFICER J. H. Turner RESPONSIBLE ORGANIZATION IERL-RTP	
FUNDS OBLIGATED $55,000	F.Y. 76	[illegible]	STARTING DATE 6/76	ESTIMATED COMPLETION DATE

EPA Form 5760-1 [illegible] [illegible]

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved [illegible] PROJECT NO. (Do not use this space) SSIE
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	76 GDD

TITLE OF PROJECT

In-House Lime/Limestone Pilot Studies

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Robert H. Borgwardt Chemical Engineer (EPA)	Donald L. Sanders Group Leader (Monsanto Research Corporation)

NAME AND ADDRESS OF APPLICANT INSTITUTION

U.S. Environmental Protection Agency/Monsanto Research Corporation
Industrial Environmental Research Laboratory
Research Triangle Park, NC 27711

SUMMARY OF PROPOSED WORK [illegible]

Objective:

Provide in-house experimental support for EPA's Shawnee Prototype Lime/Limestone test facility at Paducah, Kentucky.

Approach:

Model FGD scrubbers are operated at the EPA Environmental Research Center to provide in-house research capability in the SO_2 scrubbing area. The scrubbers are designed for maximum flexibility and quick evaluation of a wide range of process variables and operating conditions.

Plans:

Studies related to improving limestone utilization completed. Studies related to MgO addition and unsaturated operation completed. Studies related to forced oxidation of waste to gypsum completed in single stage and two stage scrubber configurations. Studies relating process variables to $CaSO_4$ scaling and gypsum saturation in progress. Evaluation of the effect of NO_2 on the oxidation of $CaSO_3$ is planned.

Project is to be completed in June 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT OPTION [illegible]	TASK NO. [illegible]-101/17	PROJECT OFFICER Walt Harmon RESPONSIBLE ORGANIZATION IERL/RTP

FUNDS OBLIGATED $60,000	F.Y. 76	[illegible] 0	STARTING DATE July 1, 1975	ESTIMATED COMPLETION DATE June 30, 1977

EPA Form 5760-1 (7-73) [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT
Operation of IERL Test Facility

[illegible]

Donald Sanders, Project Manager
Steve Schliesser
James E. MacQueen

NAME AND ADDRESS OF APPLICANT INSTITUTION
Monsanto Research Corporation
1515 Nicholas Road
Dayton, Ohio 45407

[illegible]

(1) The objective is to determine the controllability of a broad variety of industrial sources and obtain true operating data for efficiency and cost documentation for the control of specific fine particle pollutants using the EPA furnished mobile fabric filter, scrubber, and electrostatic precipitator.

(2) The approach is to conduct on site industrial source measurements with the mobile units to determine fine particulate total mass and fractional collection efficiencies for various process and device operating conditions.

(3) Current plans are to continue source tests which were initiated in 1976.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

E.P.A. OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO.	PROJECT OFFICER
[illegible]	21P-101/17	Dale L. Harmon
		RESPONSIBLE ORGANIZATION
		IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	DATE TO COMPLETE
$350,000	76		6/30/76	7/1/77

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT F-10

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

EPA 75 ODD

TITLE OF PROJECT

Flux Force/Condensation Demo in the Iron and Steel Industry

NAMES, DEPARTMENTS AND TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

(1) The objective is to demonstrate at pilot scale or small full scale the technical and economic feasibility of Flux Force/condensation scrubbing for control of fine particulate emissions from a source in the iron and steel industry.

(2) The approach is to select a site; design the demonstration scrubber system; construct and install the system; conduct a test program designed to provide necessary information to document the particle collection efficiency of the system over the particle diameter range from .01 to 10 um, the overall mass efficiency of the system, the operational reliability of the system, the economics of the system, etc.; analyze the data; and prepare a report documenting the performance, economics, engineering design and reliability of the system and specific problem areas encountered in operating the system.

(3) Current plans are to initiate the program by selecting a test site.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible] A	TASK NO. 8(P-10)/10	PROJECT OFFICER Dale L. Harmon RESPONSIBLE ORGANIZATION IERL-RTP

[illegible]	F.Y. 78	[illegible]	STARTING DATE 10/77	ESTIMATED COMPLETION DATE

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

78 [illegible]

TITLE OF PROJECT: Development of Superior Entrainment Separators

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Seymour Calvert, President
Mr. Harry F. Barbarika, Environmental Engineer
Mr. Shuichow Yung, Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Air Pollution Technology, Inc.
4901 Morena Blvd., Suite 402, San Diego, CA 92117

[illegible]

The objective of the research project is to develop an improved design for entrainment separators for scrubbers. The problems of suspended solids deposition and the resultant plugging of the entrainment separator are of primary concern to this research.

The approach will be to design and test a pilot scale (0.47 to 1.42 m^3/s) entrainment separator which is coupled with a scrubber. The most likely separator types warranting improvement which have the problem of solids deposition are zig-zag baffles and tube banks. During the experiments, locations where liquid and entrained solids tend to concentrate will be determined; washing techniques will be developed; effects on entrainment separator performance will be determined; and operational problems will be investigated. Design equations and scale-up criteria will be developed from the experimental results and a test program for a large pilot scale (14 m^3/s) entrainment separator will be proposed.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	GRANT NO. R(P)-101/20	PROJECT OFFICER L. E. Sparks RESPONSIBLE ORGANIZATION IERL-RTP

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$173,670	76		06/25/76	8/78

EPA Form 5700-1 (2-73) REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

FY [illegible]

TITLE OF PROJECT

Construct and Operate a Conditioning Agent Evaluation Facility

NAME (LAST, FIRST, INITIAL), DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N/A transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

to be selected

SUMMARY OF PROPOSED WORK [illegible]

The objective of this procurement is to design, build and operate a facility that can thermally decompose conditioning agents under temperature conditions likely to exist in a stack and then subject these decomposition products to chemical analysis. Conditioning agents are generally injected into the flue gas at high temperatures. Thus, the decomposition products, and not the agent itself, are generally the chemical species that will be emitted to the environment. This facility will provide useful data on the potential for adverse environmental effects of conditioning agents

The addition of chemical agents either to the coal or to the flue gas is one method of improving collection of high resistivity fly ash (e.g. from combustion of low sulfur coal) by electrostatic precipitators. Sulfur trioxide, sodium carbonate, and several proprietary chemicals have been used as conditioning agents. The general effectiveness and possible environmental impact of the various conditioning agents is unclear because of insufficient data.

TOTAL PROFESSIONAL [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]
AGENCY STAFF [illegible]
X RESEARCH CONTRACT
RESEARCH GRANT

TASK NO.
[illegible]-101/53

PROJECT OFFICER
L. E. Sparks

RESPONSIBLE ORGANIZATION
IERL-RTP

FUNDS OBLIGATED FY 78

[illegible]

EFFECTIVE DATE
10/78

ESTIMATED COMPLETION DATE

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]
PROJECT NO. (DO NOT USE THIS SPACE)
EPA
76 [illegible]

TITLE OF PROJECT

Effects of Conditioning Agents on Emissions from Coal Fired Boilers

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

N/A transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

The objective of this task is to field test 3 sites using conditioning agents to determine the effectiveness of the agent in improving electrostatic precipitator performance and to determine the chemical composition of the gaseous and particulate emissions with and without conditioning. Limited biological testing of the emitted particulate will be conducted.

The addition of chemical agents either to the coal or to the flue gas is one method of improving collection of high resistivity fly ash (e.g., from combustion of low sulfur coal) by electrostatic precipitators. Sulfur trioxide, sodium carbonate, and several proprietary chemicals have been used as conditioning agents. The general effectiveness and possible environmental impact of the various conditioning agents is unclear because of insufficient data.

[illegible] | SIGNATURE OF PRINCIPAL INVESTIGATOR | DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]
[illegible]
[illegible]
[illegible]

[illegible]
ROP-101/03

PROJECT OFFICER
L. E. Sparks
ORGANIZATIONAL IDENTIFICATION
IERL-RTP

FUNDS OBLIGATED | F.Y. 76 | [illegible] | STARTING DATE 06/76 | ESTIMATED COMPLETION DATE

EPA Form 5700-1 [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

SIE
NO.

78 (33)

TITLE OF PROJECT
Fine Particle/High Resistivity Electrostatic Precipitation

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N/A transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION
To be selected

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this procurement are to develop relationships between particle properties and electrostatic precipitator operating conditions and to demonstrate the feasibility of special charging systems.

To meet these objectives the contractor shall conduct theoretical laboratory scale experimental and small pilot scale studies.

Electrostatic precipitators are efficient dust collectors when particle and gas properties do not limit allowable electrical operating conditions. Existing data are inadequate for predicting the allowable conditions.

EPA sponsored research has indicated the precipitator designs incorporating special charging systems may overcome many of the problems encountered with present electrostatic precipitator designs. However, existing information is adequate to determine the feasibility of such systems especially for collection of high resistivity dust.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] CONTRACT [illegible]	TASK NO. SIP-101/23	PROJECT OFFICER Dr. L. E. Sparks RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y. 78	[illegible]	STARTING DATE 12/78	ESTIMATED COMPLETION DATE

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT: GEOMETRIC FACTORS IN FILTERS FOR THE REMOVAL OF PARTICULATE MATTER IN THE RESPIRABLE DUST RANGE

[illegible]

Principal Investigator : Dr. Bernard Miller, Associate Director of Research
Staff Scientists : Dr. George E. R. Lamb, Senior Scientist
: Mr. Peter Costanza, Staff Scientist

[illegible]

Textile Research Institute
601 Prospect Avenue, P. O. Box 625
Princeton, N. J. 08540

SUMMARY OF PROPOSED WORK [illegible]

A previous study established that geometric fiber parameters such as fiber diameter, surface roughness, cross-sectional shape, and crimp affected the filtration performance of nonwoven fabrics made from the fibers. That analysis was made with only two levels of each parameter, with a capacity for measuring particle sizes not smaller than 2.5 μm, and with test filters 100 mm in diameter. The proposed study will carry out measurements with an extended range of these parameters found to be significant and with instrumentation able to measure particles at least as small as 0.1 μm. The validity of the most important results will be tested by experiments involving a commercial-size bag filter operating in a laboratory-scale baghouse.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR Dr. Bernard Miller	DATE 6/10/7[illegible]

EPA OFFICE USE ONLY

[illegible]	[illegible] [illegible]-101/04	PROJECT OFFICER J. H. Turner [illegible] RTP, N.C.
[illegible] 801,786 76	[illegible]	STARTING DATE 6/7/76
		ESTIMATED COMPLETION DATE 12/78

EPA Form 5300-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0082

TITLE OF SUBJECT

Demonstration of High Efficiency - High Throughput Baghouse

Mr. Sydney Perry (Host)
John McKenna - Principal Investigator (Enviro-Systems)

NAME AND ADDRESS OF APPLICANT INSTITUTION

West Finishing Division (Host)
Fabrics America Corporation
P.O.Box 187, Concord, N. C. 28025

Enviro-Systems & Research, Inc.
3141 Patterson Avenue, S.W.
Roanoke, Va. 24016

(1) Examine technical and economic aspects of small, full scale, reverse air baghouse operated at filtration velocities up to 9 fpm on a stoker fired industrial boiler.

(2) a. Operate baghouse for a minimum period of 10 months using Nomex, Gore-Tex, Teflon and Dralon T fabrics.
 b. Determine fabric performance and life.
 c. Determine system performance and costs.
 d. Record all pertinent boiler and filter system operating parameters.
 e. Characterize flue gas streams and fly ash.

(3) System scheduled to start 12/76. Options include testing additional fabrics and testing SO_2 removal capabilities.

SIGNATURE OF PRINCIPAL INVESTIGATOR | DATE

FOR OFFICE USE ONLY

☒	R(P-10)/64	PROJECT OFFICER J. H. Turner RTP/N.C.

$500,000	76		3/16/76	10/78

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

FA [illegible]

TITLE OF PROJECT

Impacts of Conditioning on Power Plant Emissions Through Controlled Airborne Sampling

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

N/A transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Objective: To test the feasibility of using a captive balloon capable of carrying a sampling package to ascertain the concentration of solid and certain liquid and gaseous pollutants in a fossil fuel power plant plume. Once the feasibility is proven it is anticipated that this sampling scheme would be used to ascertain the impact of flyash conditioning on the emitted pollutants as well as extending mass balance studies and investigating the primary versus secondary aerosol content of stack plumes in areas where periods of rather stable horizontal plume conditions occur.

Technique: A tethered balloon with multiple particulate samplers will be used to cross-section an isolated power plant plume at various distances from the stack collecting only flyash in this test. Composition and size distribution will be compared with stack samples and plant operating conditions.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (If any)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) [illegible] [illegible] [illegible] X [illegible]	TASK NO. 9(P-10)/19	PROJECT OFFICER L. E. Sparks RESPONSIBLE ORGANIZATION IERL-RTP	
[illegible] FY 16	[illegible]	EFFECTIVE DATE	ESTIMATED COMPLETION DATE

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

78 [illegible]

TITLE OF PROJECT

Evaluation of Novel Devices

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. David Ensor

NAME AND ADDRESS OF APPLICANT INSTITUTION

Meteorology Research, Inc.
464 West Woodbury Road
P. O. Box 637, Altadena, CA. 91001

SUMMARY OF PROPOSED WORK [illegible]

1. Objectives are to obtain experimental performance data on novel fine particulate collection devices.

2. Approach will be to measure inlet and outlet particle size down to .01 micron diameter so that fractional size efficiency can be determined. A suitable range of operating parameters will be explored.

3. Current plans are to test 7 devices.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	TYPE NO. 8(P-10)/29	PROJECT OFFICER Dale L. Harmon RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	EXPECTED COMPLETION DATE
$70,000	78		11/3/77	11/3/78

EPA Form [illegible] REPLACES [illegible] FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

[illegible]

TITLE OF PROJECT

Evaluation of Novel Fine Particulate Control Devices

[illegible]

Wallace B. Smith, Head, Environmental Physics Research Section
Joseph D. McCain, Senior Physicist

NAME AND ADDRESS OF APPLICANT INSTITUTION

Southern Research Institute
2000 Ninth Avenue, South
Birmingham, Alabama 35205

[illegible]

Tests will be done to evaluate three novel fine particulate control devices. A novel fine particulate control device for the purposes of this program is defined as an existing full-scale or pilot-scale device or system based on new collection principles or on radical redesign of conventional collectors. Where possible, existing installations on industrial sources will be tested. Also, sources with a high percent of fine particulate are preferred.

Performance tests will include mass collection efficiency measurements using EPA Method 5, and fractional efficiency measurements from 0.01 µm to approximately 10 µm using cascade impactors, condensation nuclei counters and diffusion batteries, and optical and/or electrical methods.

SIGNATURE OF PRINCIPAL INVESTIGATOR: Wallace B. Smith
DATE: 10/[illegible]/76

FOR OFFICE USE ONLY

PROJECT OFFICER: Dale L. Harmon
EPA, IERL, Research Triangle Park, N.C.

FUNDS OBLIGATED: 78,198
STARTING DATE: 9/14/76
ESTIMATED COMPLETION: 9/13/77

EPA Form 5760-1 [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. 158-R0001 PROJECT NO. (Do not use this space) SIE 78 ODD

TITLE OF PROJECT

Fabric Filtration Research - EPA In-House

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. James H. Turner, Chemical Engineer, PATB, UIPD, IERL-RTP

NAME AND ADDRESS OF APPLICANT INSTITUTION

U. S. Environmental Protection Agency, Environmental Research Center
Research Triangle Park, N. C. 27711

[illegible]

(1) Ongoing research in Fabric Filtration to investigate fine particle capture and penetration mechanisms, cleaning effects, and advanced fabrics.

(2) Collect data by means of well instrumented and controlled single compartment baghouses.

(3) Previous work has been published; current and future work will be published in EPA reports. High temperature filtration and filtration in harsh environments will be studied.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	[illegible] SIP-101/80	PROJECT OFFICER J. H. Turner RTP, N.C.		
[illegible] $810,000	F.Y. 78	[illegible]	STARTING DATE Continuing	[illegible] Continuing

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

76 FUND

TITLE OF PROJECT:

Source Assessment Stack Sampler Development Program

NAME, DEGREE, DEPARTMENT, AND TITLE OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

David E. Blake, Section Leader, Source Assessment and Cleanup

Hans Dehne, Section Leader, Hardware Design and Development

Fred Moreno, Program Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

Acurex Corporation, Aerotherm Division
485 Clyde Avenue, Mountain View, California 94042

[illegible]

The objective of this project is to design and construct three (3) Source Assessment Stack Sampling (SASS) trains suitable for use in the Environmental Protection Agency's Level 1 Environmental Assessment Program. Each train will include four stages of particulate size fractionation (three (3) cyclones and one (1) filter), a Tenax trap capable of capturing volatile organic species, an impinger system for capturing trace elements, and necessary gas flowrate and temperature monitoring apparatus.

The program is divided into four (4) tasks. First, two partial SASS trains are to be constructed for incinerator ship sampling. Second, a design report will be prepared that analyzes the various possible SASS options and features. Third, after EPA has selected one of the designs presented, 1 complete SASS train will be designed and constructed. Fourth, the two partial incinerator ship trains will be upgraded to full SASS equivalency.

SPECIFY PROFESSIONAL SCHOOL IF INVOLVED [illegible] NA	SIGNATURE OF PRINCIPAL INVESTIGATOR Fred Moreno	DATE 5/20/76

FOR OFFICE USE ONLY

[illegible]	TASK NO. 1NIP-11	PROJECT OFFICER William B. Kuykendal ORGANIZATION IERL-RTP, IPD, PIB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$43,163	76		May 4, 1976	Dec. 31, 1976

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. [illegible]

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT: Investigation & Feasibility Study of Methods for [illegible]

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

W. H. Henry, Senior Researcher, Chemistry Department

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle-Columbus Laboratories
505 King Avenue
Columbus, OH 43201

SUMMARY OF PROPOSED WORK — [illegible]

1. **Objective:** The objective of the proposed program is to investigate methods of inorganic compound identification of particulate emissions, select candidate methods, and based on the results of laboratory and field trials, to develop, validate, and optimize a sampling and analytical methodology.

2. **Approach:** Subject to revision based on information obtained from a literature search the basic approach planned is: (a) Obtain large amounts of representative combustion process emission samples and determine their complete cation-anion contents. Chemical and physical separations will be made of these followed by structural (diffraction, infrared) and [redacted] state determinations. The objective here is to test and evaluate analytical technology. (b) By use of a large multifuel experimental furnace generate fossil fuel emissions under controlled combustion conditions and utilize an existing thermodynamic data base to predict logical forms of the combustion products to assist and guide the analytical techniques judged most useful via the Phase I efforts. (c) Field test the developed analytical techniques at up to four fossil fuel emission sources. Optimize and validate the methodology and describe performance specifications.

3. **Current Plans:** Literature search plus survey of prior and on-going research programs are followed up by personal discussions with identified researchers who have developed promising techniques. Concurrently large amounts of emission particulates from coal and oil combustion sources will be obtained for laboratory trials of methodology.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR [illegible]	DATE [illegible]

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SUPPORT METHOD (Check one) [illegible] ✓ [illegible] [illegible]	TYPE NO. 11	PROJECT OFFICER [illegible] EPA [illegible]

FUNDS OBLIGATED $[illegible] 195	F.Y. 76	[illegible]	STARTING DATE 6/18/76	ESTIMATED COMPLETION 9/18/77

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

150 K FY-76 proposed

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT: Effective Control of Secondary Water Pollution from Flue Gas Desulfurization Systems

[illegible]

Howard Hartigel - Chief Chemist
Charles Ulthan - Test & Materials Supervisor
Theodore Fosberg, PHD - Process Group Supervisor
Harold Bannon - Test Engineer
Terrance O'Neall - Process Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION
Resources Conservation Co.
P. O. Box 936
Renton, Washington 98055

[illegible]

Objective: Demonstrate a method for effective control of secondary water pollution resulting from a flue gas desulfurization process.

Approach: Waste from the Chiyoda Flue Gas Desulfurization Process will be treated using the Resources Conservation Co. (RCC) 6,000 gallons per day Brine Concentrator pilot evaporator. This vertical tube, vapor compression evaporator will concentrate the waste stream using the RCC seed slurry process presently used in commercial service treating cooling tower blowdown waters with chemistries similar to the Chiyoda SO_2 scrubber wastes.

Current Plans: A glassware analysis of the scrubber waste will provide a basis for selection of evaporator operating conditions. These will be verified on a bench model evaporator prior to a 90 day demonstration conducted at the Scholz Power Station, Gulf Power Co., Sneads, Florida with the RCC 6,000 gpd evaporator and the waste from the Chiyoda SO_2 scrubber liquid pond. The final report will contain an estimate of operating and capital costs for providing full scale treatment of the desulfurization stream.

[illegible]
N/A

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FILE NO.
IERP-151/4

PROJECT OFFICER
Fred A. Roberts

IERL/RTP

STARTING DATE
3/01/76

ESTIMATED COMPLETION DATE
6/30/77

150,000

76

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0081

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE
78 [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT
Species Concentration and Temperature Measurements in Flames

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Alan C. Eckbreth	Paul A. Bonczyk
Senior Research Scientist	Senior Research Scientist
Program Manager and Principal Investigator	Principal Investigator
Atomic and Molecular Structure	Atomic and Molecular Structure

NAME AND ADDRESS OF APPLICANT INSTITUTION
United Technologies Research Center
Silver Lane
East Hartford, CT 06108

SUMMARY OF PROPOSED WORK [illegible]

The contractor shall develop and demonstrate a non-perturbing *in-situ* technique to extract point chemical concentration and temperature data from furnace flames. In the first task the contractor shall conduct a comprehensive review of potential techniques and recommend the most promising ones for laboratory development. Under Task II the contractor shall develop and evaluate the techniques selected under Task I in a series of laboratory tests. Task I - Technique Review and Selection: The contractor shall conduct a comprehensive review to identify the potential techniques for measuring chemical composition and temperature in furnace flames and other hostile environments. The review shall be limited to those techniques which are *in-situ* and do not perturb the environment. The species of interest to be measured in trace quantities include HCN, CO, H, NH, NH_2, NH_3, NO, NO_2, SO, SO_2, O, OH, CN, CH_4, O_2, and CO. The contractor shall develop basic block diagrams and system descriptions of the potential techniques. Each technique assessment shall include: (1) Estimate of the state-of-the-art of each major component for each system, (2) Estimate of the probability of success of any necessary development, (3) Estimate of the development and final system costs, and (4) Estimate of the time required for the final system. Task II - Laboratory Development: The contractor shall conduct a laboratory evaluation of the technique(s) selected under Task I on a selected number of representative species. The contractor shall design and fabricate a breadboard apparatus to evaluate the technique(s) in small scale gas and oil flames. The contractor shall develop the technique(s) during the laboratory testing and shall establish the operational limits. Specifically, the contractor shall evaluate the effects of (1) thermal gradients, (2) particulates, (3) turbulence, and (4) specie interferences.

SPECIFY PROFESSIONAL FIELD OF INVESTIGATION [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
Engineering, Applied Science	Alan C. Eckbreth	10/1/76

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SUPPORT METHOD (Check one)	TYPE NO.	PROJECT OFFICER
☐ GRANT ☐ [illegible] ☒ CONTRACT ☐ [illegible]	14(P-16)	William H. Kuykendal ORGANIZATIONAL LOCATION EPA, IERL, Research Triangle Park, N.C.

FUNDS OBLIGATED	F.Y.	[illegible]	DATE OF AWARD	EXPIRATION/COMPLETION DATE
[illegible]	76		7/76	[illegible]

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

76 [illegible]

TITLE OF PROJECT
Sampling and Analysis Methods for POM & Other Organic Pollutants

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Philip Levins, Project Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

Arthur D. Little, Inc.
One Acorn Park
Cambridge, Massachusetts 02140

SUMMARY OF PROPOSED WORK [illegible]

The ability of organic material to produce cancer has been known for some time. Field studies dealing with this class of compounds as pollutants have been relatively few and usually limited in scope. Part of the reason for this has been the complexity and expense of sampling and analysis. However, increased efforts in environmental assessment and technology development for stationary sources of organics will require that engineers and scientists deal with these problems, and with the need for methods development testing and applications research. Adequate and cost-effective methods for organic pollutants becomes even more imperative in light of the nature of many of the energy-related EPA projects.

The purpose of this effort is to provide for the evaluation, development, field testing and applications research of the organic substances sampling and analytical procedures necessary to conduct environmental assessments and technology development projects in the energy and industrial processes programs. The contractor will be responsible for: measurement evaluation and development; preparation of guidelines and recommended procedures; solution of specific problems; comprehensive analysis of samples; and, assistance to project officers and contractors in the application of procedures to specific process streams.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] NA	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 9-26-76

FOR OFFICE USE ONLY

X	[illegible]	TASK NO. [illegible]	PROJECT OFFICER E. D. Johnson RESPONSIBLE ORGANIZATION IERL-RTP, IPD, PMB

FUNDS OBLIGATED $240,000	F.Y. 76	[illegible] 3	STARTING DATE March 1976	EXPECTED COMPLETION DATE March 1979

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

The Development of Fugitive Emissions Sampling Techniques

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Principal Investigator - Henry J. Reinsberg, Sr. Project Engineer, Environmental Technology Division

Technical Director - John R. [illegible], Vice President and Chief Engineer

Project Directors - [illegible], Engineering Mgr., Env. Technology Division
[illegible], Project Engineer, [illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRC - THE RESEARCH CORPORATION of New England
125 Silas Deane Highway
Wethersfield, CT 06109

SUMMARY OF PROPOSED WORK [illegible]

OBJECTIVE - To provide fugitive emissions measurement methodologies required for environmental assessment and control technology development projects related to stationary source energy and industrial process programs of the Environmental Protection Agency

APPROACH - Conduct a continuing program of evaluation, development, testing and field adaptation of measurement techniques for air borne and water borne fugitive emissions from process and effluent streams, including the following:

- Review current programs to identify measurement requirements;
- Formulate specifications for basic sampling and analysis procedures;
- Conduct laboratory and field studies to determine effectiveness of adapting procedures to specific process streams;
- Review and critique measurement programs developed or proposed in other EPA programs;
- Conduct sampling and analysis programs for special projects;
- Prepare documents defining recommended measurement procedures and their application to process streams.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Henry J. Reinsberg	DATE 5 January 1976

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[illegible]	[illegible] 1NIP-16/5	PROJECT OFFICER Robert M. Statnick [illegible] IERL-RTP, SPB, PMB		
$170,000	76	2	Dec. 17, 1975	Dec. 17, 1976

EPA Form [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

78 DDD

TITLE OF PROJECT
Particulate Sampling and Support

[illegible]

Mr. Wallace B. Smith, Principle Investigator
Mr. Joseph D. McCain, Senior Physicist
Mr. Kenneth M. Cushing, Research Physicist

NAME AND ADDRESS OF APPLICANT INSTITUTION
Southern Research Institute
2000 Ninth Avenue, South
Birmingham, Alabama 35205

SUMMARY OF PROPOSED WORK [illegible]

Conduct a continuing program of evaluation, development, testing and field adaptation of measurement techniques for particulate mass and size in process and effluent streams.

The division of effort will be:

50% - Methods Evaluation and Development
5% - Methods Adaptation and Application Studies
10% - Measurement and Test Program Reviews
15% - Sampling Support
20% - Preparation of Guidelines and Procedures

Methods to be investigated include cascade impactor and series cyclones for particle size measurement, both theoretically and empirically, and continuous mass monitors. Guidelines and procedures for particulate sampling are being prepared including a general review document and specific manuals for ESP's, baghouses and scrubbers.

[illegible] NA	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

X	[illegible]	[illegible] 16IP-161/5	PROJECT OFFICER D. Bruce Harris IERL-RTP, IPB, PMB	
[illegible] 8235.DOC	F.Y. 76	[illegible] 2	STARTING DATE Nov. 20, 1975	ESTIMATED COMPLETION DATE Nov. 20, 1978

EPA Form 5760-1 (7-74) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

FORM APPROVED

PROJECT NO. (DO NOT USE THIS SPACE)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

78 C[illegible]

TITLE OF PROJECT:
Improve Reliability and Performance of a Droplet Measuring Device

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:
Dr. Daniel E. Magnus, Project Director
Mr. Hector Medecki, Principle Investigator
Mr. Gary Westoff, Electronics Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION
KLD Associates, Inc.
300 Broadway
Huntington Station, N. Y. 11746

SUMMARY OF PROPOSED WORK [illegible]

The droplet measuring device shall be adapted to automatic operation for the evaluation of demister performance. The following aspects shall be investigated and, in particular, conduct a feasibility stury and modify the hardware to provide:

a) Remote operation of the droplet measuring device including multiple sensors at different locations in a scrubber or demister.

b) Automatic reset and hard copy printout of droplet distribution; flow velocity, temperature, sampling period and absolute time.

c) Examine other electronic components used in the evaluation of demister performance.

IDENTIFY PROFESSIONAL STAFF INCLUDED IN S.I.E. [illegible]
NA

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

TASK NO.
14IP-161/5

PROJECT OFFICER
D. Bruce Harris

RESPONSIBLE ORGANIZATION
IERL-RTP, IPD, PTB

FUNDS OBLIGATED $50,350	F.Y. 76	[illegible] 1	STARTING DATE June 25, 1975	ESTIMATED COMPLETION DATE April 1, 197

EPA Form 5760-1 (7-74) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT P-17

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. (DO NOT USE THIS SPACE)
SSIE
NO.
76 ODD

TITLE OF PROJECT
Sampling and Analysis for the US/USSR Joint Sampling

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.
Ms. Diane Sommener, Project Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION
York Research
One Research Drive
Stamford, Connecticut

SUMMARY OF PROPOSED WORK [illegible]

Field testing support for the U. S. participation in the Soviet phase of the joint US/USSR sampling program. Particulate mass and sizing equipment shall be assembled, tested and shipped to the Soviet Union.

IDENTIFY STATE(S) [illegible]
NA

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]
☒ [illegible]

TASK NO.
15(P-17)

PROJECT OFFICER
D. Bruce Harris

RESPONSIBLE ORGANIZATION
IERL-RTP, IPD, PMB

FUNDS OBLIGATED
$23,895

F.Y.
76

[illegible]
none

STARTING DATE
June 2, 1976

ESTIMATED COMPLETION DATE
Sept. 15, 1976

EPA Form 5610-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0011

NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

C/1A

TITLE OF PROJECT

Ice Fog Abatement & Pollution Reduction at a Sub-Arctic Coal-Fired Heating Plant

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Leroy Leonard, Principal Investigator, Environmental Research Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701

SUMMARY OF PROPOSED WORK [illegible]

Abstract

This proposal provides for the design, construction, and monitoring of a model (less than full scale) air pollution control system at the coal-fired power plant located on the Fairbanks campus of the University of Alaska. The system operates on a direct contact scrubber-condenser principal. By spraying water down the muzzle of the power plant exhaust stack, counter to the direction of flow of the hot flue-gas, the system is intended to perform the following function:

1) Eliminate, or to a large extent reduce, ice fog (frozen water vapor emissions) from the exhaust stack during winter operation.
2) Remove fly ash and other particulate constituents from flue-gas.
3) Reduce oxides of sulfur and other noxious components of the flue-gas.

A total engineering evaluation of the system will be made, which will consider both its viability as an air pollution system and its impact on the environment.

SPECIFY PROFESSIONAL SCHOOL [illegible] Research Institute

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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SUPPORT ACTION [illegible]

X [illegible]

TASK NO. 1

PROJECT OFFICER Harold I. Coutts

RESPONSIBLE ORGANIZATION EPA, Corvallis, Oregon

FUNDS OBLIGATED $64,861

F.Y. 76

STARTING DATE 6/9/76

ESTIMATED COMPLETION DATE 9/77

EPA Form 5760-1 (2-73) REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (DO NOT USE THIS SPACE) EPA-IAG-D6-E721-BB

TITLE OF PROJECT

Organic and Sulfate Sampling at Colbert Steam Plant

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Paul Fennelly

NAME AND ADDRESS OF APPLICANT INSTITUTION

GCA/Technology Division
GCA Corp.
Bedford, Mass. 01730

SUMMARY OF PROPOSED WORK [illegible]

To sample and analyze at Colbert Steam Station, TVA, for organics, POM's, PCB's, and sulfates. This work supports TVA's efforts to characterize fine particulate and vaporous trace element emissions from power plants.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE Sept. 22, 1976

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO. 5	PROJECT OFFICER RESPONSIBLE ORGANIZATION TVA

FUNDS OBLIGATED $15,770	F.Y. 76	[illegible] 0	STARTING DATE 6-1-76	ESTIMATED COMPLETION DATE 11-1-76

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

EPA-IAG-D5-0721

TITLE OF PROJECT

Waste Heat Utilization

NAMES, DEPARTMENTS AND PROFESSIONAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: B. J. Bond, Asst. Director of Agricultural Development* (Ext. 418)
Support Personnel: C. G. Madewell, Agr. Economist, Agr. Resource Dev. Branch* (Ext. 743)
J. J. Maddox, Agriculturist, Agr. Resource Dev. Branch* (Ext. 743)
D. A. Mays, Agriculturist, Soils & Fertilizer Research Branch* (Ext. 203)
[illegible], Agricultural Engineer, Agr. Resource Dev. Branch* (Ext. 743)

NAME AND ADDRESS OF ORGANIZATION

*Tennessee Valley Authority (Telephone 205-383-4631)
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress [illegible]

Task I. Soil heating to extend crop growing season—Specific objectives are (1) heating soil to extend the crop growing season, and (2) improving production efficiency of field and horticultural crops. Field experiments have been conducted in small plots using buried electric cables and buried warm water pipes as heat. Porous plastic pipes were used for subirrigation. Greenhouse experiments have been conducted in a 30' x 100' double-layer plastic covered greenhouse, without a conventional heating system. The soil is heated by running water through PVC pipes. Results with sweet corn, string beans, and summer squash, when planted early in April, showed yield increases of more than 30 percent due to the increased soil temperature. In a plastic covered greenhouse, with the only source of heat being soil warmed by waste heat, high-quality yields of broccoli, cauliflower, and Bibb lettuce were produced in midwinter when outdoor production without waste heat was negligible.

Task II. Biological recycling of nutrients from livestock wastes—Specific objectives are (1) investigating the practical applications of waste heat to biological nutrient recycling systems utilizing livestock waste to grow aquatic plants such as algae and duckweed; (2) investigating the possibility of using fish, clams, and/or other organisms as harvesters of the aquatic plants; and (3) processing these into high-protein feed supplements for livestock. Outdoor test pool facilities, a plastic covered greenhouse, and laboratory facilities have been erected at Muscle Shoals and preliminary work is concentrating on developing growth response curves for filter feeding organisms. Laboratory-scale research is testing the effectiveness of heated water to enhance plant and animal growth rates in systems fertilized with swine manure. This type of system would recycle nutrients for productive purposes and reduce the amount of nutrients that would pass from feedlots and be lost to the environment.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (In U.S. only) None	SIGNATURE OF PRINCIPAL INVESTIGATOR B. J. Bond	DATE 4/29/76

FOR OFFICE USE ONLY

SUPPORT METHOD ☐ INTRAMURAL ☐ RESEARCH GRANT ☒ CONTRACT ☐ INTERAGENCY	TASK NO. I & II	PROJECT OFFICER B. J. Bond PERFORMING ORGANIZATION Tennessee Valley Authority Office of Agricultural & Chemical Development		
FUNDS OBLIGATED $100K	F.Y. 1976	NO. OF PROFESSIONAL MAN-YEARS 3	STARTING DATE May 1, 1973	ESTIMATED COMPLETION June 1980

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0081

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

EPA-IAG-D5-0721; [illegible]

TITLE OF PROJECT: **Energy Requirement Optimization Study of Selected Processes for Removing SO_2 from Power Plant Stack Gases**

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Project Director: A. F. Little, Project Engineer, Design Branch, Tennessee Valley Authority, Office of Agricultural and Chemical Development, Muscle Shoals, Alabama 35660 (Telephone 205-383-4631, ext. 510)

NAME AND ADDRESS OF APPLICANT INSTITUTION: **Emission Control Development Projects**

Tennessee Valley Authority
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK [illegible]

The primary objectives of the study project are to summarize the energy requirements of selected power plant stack gas SO_2 removal processes and then prepare economic and feasibility analyses of process modifications for reducing and optimizing the energy requirements for the processes. Conceptual design and cost studies will be surveyed for energy requirement data. Also a survey will be made of the energy requirement data for any existing demonstration and commercial units. The data obtained from these surveys will be summarized and analyzed to establish a current base energy requirement level for each of the processes. Feasibility and economic evaluations will then be made of process modifications and variations for reducing and optimizing the energy requirements. Process modifications and variations to be studied will include such items as scrubber type, reheat level and type, heat recovery systems, etc.

The work on the project was delayed due to changes in the project schedule in conjunction with the schedule on a sludge disposal cost study project being prepared by TVA under the same contract. Thus very little progress has been made on the project. Activity on the project will resume during the fourth quarter of FY 1976. A preliminary meeting was held between TVA and EPA to discuss the premises and scope for the project.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY) None	SIGNATURE OF PRINCIPAL INVESTIGATOR A. F. Little A. F. Little	DATE 4/28/76

FOR OFFICE USE ONLY

DOCUMENT METHOD [illegible] ☐ [illegible] ☐ [illegible] CONTRACT ☒ INTERAGENCY AGREEMENT	TASK NO. 1	PROJECT OFFICER A. F. Little PERFORMING ORGANIZATION Tennessee Valley Authority Office of Agricultural and Chemical Development		
FUNDING ACTIVITY 0306	F.Y. 1976	AMOUNT OF FUNDING [illegible]	PROJECT START DATE May 7, 1975	PROJECT COMPLETION DATE September 1977

EPA Form 5700-1 (7-75) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0011

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

EPA-IAG-D5-E721 BB1

TITLE OF PROJECT

Comparative Economics of Major Stack Gas Emission Control Processes

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: H. L. Faucett, Chemical Engineer, Design Branch, Tennessee Valley Authority, Office of Agricultural and Chemical Development
Support Personnel: S. V. Tomlinson, Chem. Eng.; Frank M. Kennedy, Chem. Eng.; J. W. Barrier, Chem. Eng.; J. D. Maxwell, Chem. Eng.; T. A. Burnett, Chem. Eng.;

NAME AND ADDRESS OF APPLICANT INSTITUTION Emission Control Development Projects*
*Tennessee Valley Authority (Telephone 205-383-4631, ext. 518)
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK [illegible]

The primary purpose of Task I is to review recently developed processes for desulfurization of power plant stack gases; then, systematically select and evaluate those which have the greatest degree of development and which are potentially attractive both technically and economically. These evaluations will include preparation of flowsheets, material balances, and commercial layouts; definition of process equipment; estimation of process equipment costs; preparation of capital investments and operating costs; and analysis of design and economic variables for cost sensitivity.

As part of the overall EPA sludge disposal program, Task II of this project will provide a design and cost study of the numerous lime-limestone scrubbing sludge disposal alternatives. The economic and technical premises for these comparisons will be established and surveys of cost studies and cost data for operating and planned commercial units will be made.

Task IIa will provide a review and critique of a TRW conceptual design cost study for an alumina extraction process utilizing lime-limestone scrubber sludge.

Task III is a continuing task of providing intermittent assistance to EPA in analyzing published cost estimates of power plant stack gas emission abatement systems and preparing brief reports of critique.

Task IV is similar in scope to Task I except the studies will cover front-end process alternatives, such as coal conversion systems and coal washing techniques, to stack gas treatment for emission control.

Task V is also similar in scope to Task I except the studies will provide assessments of catalytic and non-catalytic NO_x abatement systems applicable to power plant stack gas emission control.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
None	H. L. Faucett	9/11/76

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SUPPORT METHOD	TASK NO.	PROJECT OFFICER
[illegible]	I, II, IIa, III, IV, and V.	H. L. Faucett PERFORMING ORGANIZATION Tennessee Valley Authority Office of Agricultural and Chemical Development

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
83500	1976	1	May 7, 1975	February 1979

EPA Form 5760-1 (7-73) [illegible]

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

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PROJECT NO. (DO NOT USE THIS SPACE)

SSIE
EPA

EPA-IAG-D5-0721 [illegible]

TITLE OF PROJECT

Byproduct Marketing

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: Dr. J. I. Bucy, Agr. Economist, Test & Demonstration Br. (ext. [illegible]);
Support personnel: Mr. J. L. Nevins, Head, Systems & Planning Dev. Staff,
Test & Demonstration Branch (ext. [illegible]);
[illegible], Supvr., Economics & Marketing Section, Test & Demonstration Branch (ext. [illegible]);
[illegible], Section Leader, Tech. & Economic Evaluation Section (ext. [illegible])

NAME AND ADDRESS OF ORGANIZATION

Tennessee Valley Authority (Telephone 205-383-4631)
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this study is to (Task I) identify the quantities of abatement byproducts which could be produced with air pollution abatement processes installed at power plants and other significant point sources of sulfur emissions to meet air pollution standards in the 48 contiguous states of the U.S.; (Task II) to determine competitive costs of existing processes which utilize elemental sulfur, and analyze existing markets in the 48 contiguous states in the U.S. with respect to potential for an orderly utilization of abatement sulfur byproducts into these markets; (Task III) determine the most economical market, distribution, and transportation systems, and using a systems approach simulate and evaluate alternative strategies for utilization of sulfur byproducts with respect to an optimal technology mix considering product markets (sulfur, sulfuric acid, ammonium sulfate, phosphate fertilizers, gypsum wallboard, and etc.); process cost differentials; and clean fuel alternatives.

[illegible] None	SIGNATURE OF PRINCIPAL INVESTIGATOR J. I. Bucy	DATE 7/22/75

FOR [illegible] USE ONLY

[illegible]		TASK NO. I thru III	PROJECT OFFICER J. I. Bucy Tennessee Valley Authority Office of Agricultural & Chemical Development		
[illegible] $100K	[illegible] 1976	[illegible] 1	STARTING DATE May 7, 1975	[illegible] COMPLETION December 1976	

EPA Form [illegible] [illegible]

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Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA-IAG-D5-0721

TITLE OF PROJECT: Development of Flue Gas Desulfurization Technology—Shawnee Lime/Limestone Scrubbing Program

NAMES, DEPARTMENTS, AND PROFESSIONAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Director: J. J. Schultz, Chemical Engineer, Design Branch (ext. 310).
Support personnel: A. V. Little, Project Engineer, Design Branch (ext. 310)
R. O. Jackson, Chemical Engineer, Design Branch (ext. 310); T. M. Daley, Process Engineer, Process Engineering Branch (ext. 316); J. G. Metcalfe, Test Facility Supervisor, Shawnee Steam Plant, TVA, Paducah, KY

NAME AND ADDRESS OF INSTITUTION

Tennessee Valley Authority (Telephone 205-383-4631)
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK [illegible]

Conceptual design and economic studies and pilot-plant tests indicate that limestone wet scrubbing offers good promise as an effective method of SO_2 emission control for stack gases of large coal-fired power plants. Using two 10-MW-size scrubber trains, a prototype-scale evaluation of the process is being conducted at Shawnee Steam Plant (unit 10). The project is a joint effort of TVA, EPA, and Bechtel Corporation. The project will evaluate the feasibility, effectiveness, and economics of limestone wet scrubbing for removal of SO_2 and particulates from stack gas. Tests with lime are also included. As part of this program, additional task efforts will include (1) sludge treatment/disposal studies, (2) advanced limestone testing, (3) advanced lime/dolomitic lime testing, (4) design/cost computer study, and (5) a gypsum-sludge utilization study.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED None	SIGNATURE OF PRINCIPAL INVESTIGATOR J. J. Schultz	DATE 9/12/76

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SUPPORT METHOD ☒	TASK NO. I through V	PROJECT OFFICER J. J. Schultz Tennessee Valley Authority Office of Agricultural and Chemical Dev.

FUNDS	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
538506	1976	1	November 1972	December 1977

EPA Form 5460-1 (2-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (Do not use this space) [illegible] EPA-IAG-D5-E721 [illegible]

TITLE OF PROJECT

Advanced Concepts SO$_2$ Removal Process Improvements - Bench-Scale Studies

[illegible]

Project Director: J. M. Potts, Chemical Research Supervisor, Applied Research Branch[a] (Ext. 235).

Support personnel: J. D. Jordan, Chemical Engineer, Applied Research Branch[a] (Ext. 535).

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority (Telephone 205-383-4631)
Office of Agricultural and Chemical Development
Muscle Shoals, Alabama 35660

SUMMARY OF PROPOSED WORK [illegible]

The purpose of Task I is to develop and improve a potassium scrubbing system for removing SO$_2$ from stack gases, absorption of SO$_2$, decomposition of resultant potassium pyrosulfite by pyrolysis, and reduction of pyrolysis product to enable production of elemental sulfur. Laboratory work on the three steps has been completed. Bench-scale work on the absorption step has been completed and work on the decomposition and reduction steps is in progress.

The purpose of Task II is to develop better methods and equipment for promoting oxidation in SO$_2$ recovery systems where this would be desirable and for coping with inadvertent oxidation in systems where oxidation is undesirable. Exploratory tests were made to study the selective precipitation of sulfate from potassium and ammonium sulfate-sulfite solutions by addition of barium carbonate. A gas-liquid contact device was designed and built which has proven superior to a Japanese-developed spinning cup oxidizer, with respect to oxygen and energy utilization, for oxidation of ammonium, potassium, calcium, and zinc sulfites.

The purpose of Task III is to study recovery of SO$_2$ as dilute sulfuric acid and utilization in fertilizer processes. Exploratory laboratory tests have been conducted on freeze crystallization of ice from dilute phosphoric acid and ammonium phosphate systems as a means of concentrating the phosphate. Planning is under way for studies on extraction of phosphate rock with dilute sulfuric acid to produce dilute phosphoric acid.

[illegible] None	SIGNATURE OF PRINCIPAL INVESTIGATOR J. M. Potts	DATE 9/30/76

FOR OFFICE USE ONLY

[illegible]	TASK NO. I, II, and III	PROJECT OFFICER J. M. Potts PERFORMING ORGANIZATION Tennessee Valley Authority Office of Agricultural and Chemical Development

FUNDS OBLIGATED [illegible]	F.Y. 1976	[illegible] 8	STARTING DATE July 1974	DATE OF COMPLETION September 1976

EPA Form 5760-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

SSIE

EPA-IAG-D6-E721-BEV

TITLE OF PROJECT: Cost Comparison of Commercial [illegible]
Power Plants to a Conventional Coal-Fired Steam Plant with Flue Gas Desulfurization

[illegible]

John T. Reese, Chemical Engineer
Power Research Staff
1350 Commerce Union Bank Building
Chattanooga, TN 37401 (615) 755-2345

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority
Knoxville, Tennessee

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to compare the commercially projected costs of both atmospheric (AFB) and pressurized (PFB) fluidized-bed power plants to the costs of a conventional coal-fired steam power plant utilizing flue gas desulfurization.

The approach includes: (1) establishment of design basis for comparison of each power plant; (2) development of conceptual design and cost estimates for each power plant; (3) comparison of total costs for each plant concept. NASA-ECAS results will provide conceptual design and cost estimates for the fluid-bed cases.

Current plans include: (1) modification of ECAS AFB and PFB design information to enable direct comparison to the conventional plant design information provided by NASA; (2) consolidation of design reviews prepared by various TVA divisions into a single TVA utility review; (3) presentation of capital and operating costs associated with each of the three power plant types.

NAMES OF PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR John T. Reese	DATE 9/20/76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	TASK NO. 6	PROJECT OFFICER John T. Reese PERFORMING ORGANIZATION Power Research Staff, TVA		
FUNDS OBLIGATED 100 K	FY 1976	[illegible] A	STARTING DATE June 1975	ESTIMATED COMPLETION DATE February 1977

EPA Form [illegible] [illegible]

D. DIRECT COMBUSTION

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

TITLE OF PROJECT: Environmental Assessment of Residues from the Fluidized Bed Combustion of Coal and the Gasification of High-Sulfur Fuel Oils

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Ralph Stone, Project Director; Richard Kahle, Project Coordinator; J. Rodney Marsh, Senior Staff Chemist; James Rowlands, Senior Field Engineer; Mazhar Mohiuddin, Chemical Engineer; Bruce Golden, Staff Geologist

NAME AND ADDRESS OF APPLICANT INSTITUTION

Ralph Stone and Company, Inc.
10954 Santa Monica Boulevard
Los Angeles, California 90025

SUMMARY OF PROPOSED WORK [illegible]

1) The primary objective of the project is to assess the environmental impact of the disposal or utilization of residues from fluidized bed coal combustion and high-sulfur fuel oil gasification. The specific objectives are to: a) characterize the residues from these processes, b) identify the leachate quantities and constituents from land disposal of the residues, c) evaluate the potential environmental impact of disposing the residues into different environments, and d) investigate the commercial utilization of these residues.

2) Literature reviews, laboratory investigation, and field studies will be performed for this project. The literature search will provide information on the disposal and utilization of similar residues (coal ash, SO_2 scrubber residues). The laboratory investigations will characterize the residues and duplicate, on a bench scale, the environmental disposal of the residues. Field studies will extend and verify the laboratory results. Laboratory investigations will also be conducted to determine the possibility of recovering and marketing the residues. An evaluation of requirements for treating residues will be made to see if treatment can enhance the product use or is required for disposal.

3) We are currently engaged in the literature searches and are preparing to initiate the laboratory studies.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
Ralph Stone and Company, Inc.		10/30/75

FOR OFFICE USE ONLY

[illegible]	TASK NO.	PROJECT OFFICER Chapman RESPONSIBLE ORGANIZATION [illegible] RTP
	1	

FUNDS [illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$250,000	76	1	10/6/75	10/6/78

EPA Form 5760-1 (8-74) [illegible]

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARE FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

ROAP
PPE

OOO

TITLE OF PROJECT

Update of Environmental Assessment of Conventional Combustion Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Norman Surprenant

NAME AND ADDRESS OF APPLICANT INSTITUTION

GCA/Technology Division
GCA Corp.
Bedford, Massachusetts 01730

SUMMARY OF PROPOSED WORK [illegible]

The report updates Volume II of this series (EPA-600/2-76-046b). It identifies and discusses major recent on-going and proposed programs in the area of pollutant emissions from combustion sources. The information presented covers the period from December 1975 to June 1976 and was obtained through a review of the literature and contact with governmental and industrial representatives.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE Sept. 22, 1976

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]		TASK NO. 5		PROJECT OFFICER Ronald A. Venezia RESPONSIBLE ORGANIZATION IERL-RTP, [illegible]
FUNDS OBLIGATED $10,[illegible]	F.Y. 76	[illegible] N.A.	STARTING DATE 01-[illegible]	ESTIMATED COMPLETION DATE Aug. 1976

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

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OMB No. [illegible]

PROJECT NO. (Do not use this space)

[illegible]

78 CDO

TITLE OF PROJECT

Environmental Assessment/Systems Analysis & Program Support for Fluidized-Bed Combustion

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON PROJECT

Dr. H. Nack	Energy and Environmental Process Research Dept.,	Assoc. Section Manager
Dr. [illegible] Bloom	"	Principal Scientist
Dr. [illegible] Murthy	"	Staff Engineer
Mr. [illegible] Felton	"	Research Scientist
Mr. J. [illegible] Allen	"	Program Office Manager
Mr. [illegible] Hall	"	Research Leader

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle-Columbus Laboratories, 505 King Avenue, Columbus, Ohio 43201
(614)-424-6424, x-4998

SUMMARY OF PROPOSED WORK [illegible]

The broad objectives of this program are to provide a total picture of the fluidized-bed combustion process, including (1) the environmental consequences of fluidized-bed combustion processes and the identification of important emissions to any medium and methods for their control, (2) an assessment of the technical and economic feasibility of fluidized-bed combustion process variations and any required emission control systems, (3) emission goals for the fluidized-bed combustion process and desirable emission standards for the next 25-30 years, and (4) program support to EPA for its total fluidized-bed program.

These objectives will be accomplished by a multidisciplinary effort drawing upon the research staff's experience; published literature and reports; contacts with government and industrial organizations active in fluidized-bed combustion research; and by detailed measurements of emissions from fluidized-bed combustion processes in operation and of the ambient environmental quality at the sites of selected existing or planned fluidized-bed combustion facilities. Program support will be provided to EPA by the principal investigators supplemented as needed by the expertise of Battelle's total staff and consultants.

[illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]
X

FILE CO
5(b)-8)

PROJECT OFFICER
D. Bruce Henschel

RESPONSIBLE ORGANIZATION
IERL-RTP

FUNDS OBLIGATED
$1,214,000

F.Y.
78

[illegible]
2

STARTING DATE
2-16-75

ESTIMATED COMPLETION DATE
FY-1981

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)
SSIE
GPO
78 [illegible]

TITLE OF PROJECT

NO Emissions from Fluidised Bed Combustion

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

János M. Beér
Professor of Chemical and Fuel Engineering
Chemical Engineering Department

NAME AND ADDRESS OF APPLICANT INSTITUTION

Massachusetts Institute of Technology
77 Massachusetts Ave.
Cambridge, Mass. 02139 (617) 253-6661

SUMMARY OF PROPOSED WORK [illegible]

The intent of the MIT grant is to determine the NO formation-destruction processes in continuously operated fluidised bed combustors. Batch type kinetic studies will be carried out with an externally heated fluidised bed and a pressurised fluidised bed. The objectives of the study are to develop a mechanistic mathematical model for the prediction of NO emission, to provide physical-chemical input parameters for the model by an experimental study, to generate information necessary for the development of new control technology of NO_x emissions, and to test the mathematical models over wide ranges of operating variables.

The results of this study have the potential to advance the present understanding of the mechanism of formation and destruction of "fuel NO" in fluidised beds, and will provide input parameters for prediction procedures used in optimisation studies of fluidised combustion.

IDENTIFY PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR(S)	DATE

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SUPPORT OBTAINED FROM [illegible]	FILE NO.	PROJECT OFFICER
[illegible]	R802-51/2	Walter B. Steen RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS	FY	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$99,888	76	3	8-17-76	8-17-79

EPA Form 5760-1 (2-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	PROJECT NO. (Do not use this space) SSIE EPA 78 [illegible]

TITLE OF PROJECT

Comprehensive Analysis of Emissions from the 6" D. FFBC Unit at Battelle

[illegible]

Dr. Carl A. Flegal
Head, Analytical Chemistry Section
Applied Chemistry Department
Systems Group of TRW Inc. (213) 536-2447

NAME AND ADDRESS OF APPLICANT INSTITUTION

TRW Systems
1 Space Park
Redondo Beach, Ca. 90278

SUMMARY OF PROPOSED WORK [illegible]

The purpose of the TRW effort is to provide analytical service for the comprehensive analysis of emissions from the Battelle 6" fluidized bed combustor. TRW will develop a plan to perform Level II analysis on the previously collected samples. The approved plan will enable TRW to begin Level II analysis which includes the identification of toxic compounds in the FBC samples.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	GRANT NO. [illegible]	PROJECT OFFICER D. B. Henschel IERL-RTP

[illegible] $78,500	[illegible] 78	[illegible] 6 months only	STARTING DATE 1-8-78	ESTIMATED COMPLETION DATE 5-31-77

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

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OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

[illegible]

TITLE OF PROJECT

Experimental and Engineering Support of the Fluidized Bed Combustion Program

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Manager - Dr. D. L. Keairns, Mgr., Fluidized Bed Engineering Research

NAME AND ADDRESS OF APPLICANT INSTITUTION

Westinghouse Research Labs
Beulah Road
Pittsburgh, Pa. 15235 (412)-256-[illegible]

SUMMARY OF PROPOSED WORK [illegible]

The contractor will provide experimental and engineering support for the multi-project EPA program to develop environmental controls for fluidized bed combustion processes. The work includes development of environmental control utilizing calcium-based SO_2 control sorbents, development of environmental control utilizing alternative sorbents for SO_2 control, investigation of NO_x emissions, control of particulate emissions, control of trace element emissions, disposition of ash and spent sorbent, and general engineering support. The contractor will conduct experimental and engineering studies. The program will extend previous work carried out by Westinghouse in all of the areas identified. The program will develop design and operating data on a variety of fluidized bed combustion concepts, identify test programs and test alternative system components, provide technical support for existing and proposed plants, and provide evaluation of test data.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible] X [illegible]	FILE NO. 6(2-8)	PROJECT OFFICER D. B. Henschel RESPONSIBLE ORGANIZATION IERL-RTP

[illegible] $11,000	FY 76	[illegible] 5	STARTING DATE 6-6-76	ESTIMATED COMPLETION DATE FY-1981

EPA Form 5760-1 (1-76) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

[illegible]

FB [illegible]

TITLE OF PROJECT

Overview: PFBC/Desulfurization Variable Study on Bench-Scale Equipment

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. René Bertrand (201) 474-2039
Dr. Ronald C. Hoke (201) 474-3366

NAME AND ADDRESS OF APPLICANT INSTITUTION

Exxon Research & Engineering Co.
P. O. Box 8
Linden, N. J. 07036

SUMMARY OF PROPOSED WORK [illegible]

The technical objective is to conduct bench-scale experimental studies at elevated pressure in support of the miniplant project and of the rest of the fluidized-bed combustion program.

Utilizing the pressurized batch 4-inch I.D. bench combustor and 3.35-inch bench regenerator vessel, the contractor is conducting a test program to assess the environmental impact of a wide range of operating variables for a variety of coal/sorbent combinations. The results of this bench-scale testing will be used to guide the test program on the miniplant. The bench equipment will also be used to investigate specific technical questions and problem areas that are foreseen, or that become apparent on the miniplant.

Note: This work was absorbed into Contract No. 68-02-1312 effective 6-1-76.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	TEST NO	PROJECT OFFICER
X	6102-01/3	D. B. Henschel
		RESPONSIBLE ORGANIZATION
		IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$19,071	76	0	6-27-74	5-31-76

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY NOTICE OF RESEARCH PROJECT	Form Approved OMB No. [illegible]
	PROJECT NO. (DO NOT USE THIS SPACE)
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	SSIE EPA 78 C1[illegible]

TITLE OF PROJECT

Miniplant Studies in Support of the FBC Program

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATOR(S) OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

N.A.

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK - [illegible]

The technical objective is to investigate control technology for the fluidized-bed coal combustion and sorbent regeneration process over a wide range of variables at a scale equivalent to 0.63 MW.

The 0.63 MW (equivalent) fluidized-bed combustion/sorbent regeneration miniplant--built by Exxon under a previous EPA contract--is to be shakedown and operated over a wide range of variables. A variable test program is planned on the miniplant combustor alone, and on the combined combustor/regenerator system, to study the effects on emissions of the full range of potential pollutants. In addition, tests will be made regarding the control potential of pretreatment techniques (e.g., sorbent precalcination) and of alternative add-on devices (e.g., granular bed filters, "Tornado" cyclones, etc.).

PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]	[illegible] 68Q-01/8	PROJECT OFFICER D. B. Henschel ORGANIZATIONAL UNIT IERL-RTP

FUNDS OBLIGATED	F.Y. 78	[illegible] 3	STARTING DATE Award on Negotiation	ESTIMATED COMPLETION DATE 10/79

EPA Form 5700-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]	[illegible]

TITLE OF PROJECT

Design and Construction of a Fluidized-Bed Coal Combustion Sampling & Analytical Test Ri

[illegible]

D. J. Clark - Mgr. Fuels and Combustion Programs - Program Manager

R. S. Hanfred - Technology Directorate - Senior Project Engineer

[illegible]

Acurex Corporation/Aerotherm Division
485 Clyde Avenue
Mountain View, Calif. 94042

[illegible]

1) Objective - The objective of the project is to design, fabricate, and install in High Bay area (Wing G) of the Industrial Environmental Research Laboratory (IERL), a fluidized-bed combustion sampling and analytical test rig and auxiliary equipment that shall be used for IERL in-house research program. This test rig is fundamentally a research tool. Therefore, the design philosophy utilized shall be based on considerations of flexibility, accuracy, and utility.

2) Approach - The approach consists of designing a test rig with a wide range of sampling access locations suitable for use of alternative sampling and analytical techniques, and to build the rig in a modular configuration to permit evaluation of alternative control devices. Specifically, the FBC Test Rig will be designed with the flexibility to evaluate variables such as: Coal and sorbent system (feed rate, injection point and method, type, size) Start-up technique Air system (flow and FGR rate, excess air) Distributor configuration Heat removal (bed and flue gas) Bed condition: (temperature, fluidizing velocities, depth, area) Freeboard Waste solids.

3) Current plans - Aerotherm will prepare a conceptual design based on the results of input/output data gathering. A final design will be completed after analysis, review and approval of the conceptual design. The test rig will then be fabricated and installed at the EPA facility, Research Triangle Park, North Carolina. Acceptance testing and personnel training will be performed. An operating manual and as-built drawings will be delivered.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

3	[illegible]	13-06	PROJECT OFFICER J. H. Wasser SPONSORING ORGANIZATION IERL-RTP, EACD, CRB

[illegible]	[illegible]	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$330,000	76	1	7/76	12/77

EPA Form [illegible] PREVIOUS EDITIONS [illegible]

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

SSIE

EPA [illegible]

TITLE OF PROJECT

Emissions Control Technology for High Pressure Combustion Systems

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

J. H. Wasser - Project Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Environmental Protection Agency
Industrial Environmental Research Lab-RTP
Combustion Research Branch
Research Triangle Park, N. C. 27711

SUMMARY OF PROPOSED WORK [illegible]

This project will investigate, in an experimental system, the emissions from combustion of liquid and gaseous fuels at pressures between 1 and 8.5 atmospheres. Comprehensive analysis for pollutants in addition to the criteria pollutants will be carried out over a range of operating conditions. Capability for investigating several combustion system categories will be developed.

Other areas of work will involve testing and modification evaluation for control technology on actual gas turbine and diesel engines. Water/fuel oil emulsions and catalytic exhaust devices are currently under study.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 7/21/76

FOR AGENCY USE ONLY

[illegible]	G-8	PROJECT OFFICER J. H. Wasser ORGANIZATION IERL-RTP, EACD, CRB

$80,000.00	76	5-year	7/76	6/81

EPA Form 5760-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT E-7, G-16

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE [illegible]

TITLE OF PROJECT

Measurement of High Temperature, High Pressure Processes

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Fred Moreno, Program Manager
Creighton Hartman, Senior Project Engineer
Dale Blann, Test Manager, Design and Development
James Steiner, Assigned Reviewer, Support Services

NAME AND ADDRESS OF APPLICANT INSTITUTION

Aerotherm Division
Acurex Corporation
485 Clyde Avenue, Mt. View, CA 94042

SUMMARY OF [illegible]

The objective is to develop measurement techniques to generate engineering data for environmental assessment and control technology development projects evaluating high temperature, high pressure processes. The two processes of initial interest are high pressure fluidized bed combustion and coal gasification. EPA in-house research projects will be supported through review of program plans and test plans in the area of high temperature, high pressure processes and design and construction of an EPA in-house sampling test rig.

The program will first establish a baseline technology effort to provide the resources for continual problem solving. This baseline program will be supplemented with specific assignments by the EPA Project Officer. The technical level of effort will be maintained relatively constant. This program is in the initial planning stages for probe development, process evaluation and EPA in-house sampling equipment.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Fred Moreno	DATE 8/3/76

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[illegible]	TASK NO. G-16	PROJECT OFFICER William B. Kuykendal ORGANIZATIONAL UNIT IERL-RTP, CPB, FOB	
FUNDS [illegible] $301,000	F.Y. 76	[illegible] FY, 76	[illegible] Mar. 31, 1976	[illegible] Mar. 31, 1978

EPA Form [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0082

NOTICE OF RESEARCH PROJECT R-2

PROJECT NO. (Do not use this space)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT **Field Testing: Application of Combustion Modification Techniques to Control Pollutant Emissions from Industrial Boilers**

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Jerry Robinson, Project Director, Air Pollution Program

Mr. Glenn Cato, Senior Engineer, Air Pollution Program

NAME AND ADDRESS OF APPLICANT INSTITUTION:
KVB Engineering, Incorporated
17332 Irvine Boulevard
Tustin, California 92680

SUMMARY OF PROPOSED WORK — (1) Objective, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

The purpose of this work is to determine the effectiveness of known combustion modification techniques to control pollutant emissions from industrial boilers. In addition, the effort will establish what the boiler manufacturers and users can do to control emissions with existing state-of-the-art technology and where combustion research activities should be concentrated.

An experimental field test program was carried out to investigate the effects of operating variables and combustion modification (e.g., excess air level, load, flue gas recirculation, staged combustion, fuel temperature and burner design) on air pollutant emissions from industrial boilers of various designs fired with coal, oil, gas and mixed fuels. The pollutants of interest in this study were oxides of nitrogen, oxides of sulfur, hydrocarbons, carbon monoxide, smoke, combustible and non-combustible particulate and trace elements.

Final reports providing the data and conclusions from the testing of more than sixty industrial boilers under a variety of conditions have been issued. At present, an industrial boiler operator's manual and a manufacturer's manual are being prepared and are expected to be completed in the first half of 1977.

IDENTIFY PROFESSIONAL STAFF IF INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	TASK NO. 6(P-7)/1	PROJECT OFFICER Robert E. Hall RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CHB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$37,699	76	None	6/14/73	3/77

EPA Form 5780-1 (7-73) REPLACES PHS FORM 166 AND SI-SIE 166 WHICH MAY NOT BE USED.

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

75 CODE

TITLE OF PROJECT: **Field Testing: Application of Combustion Modification Technology to Industrial Combustion Equipment**

[illegible]

Mr. D. R. Bartz, General Manager, KVB, Inc.
Mr. S. C. Hunter, Project Manager, KVB, Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION

KVB, Inc.
17332 Irvine Blvd.
Tustin, CA 92680

SUMMARY OF PROPOSED WORK [illegible]

The program objective is to evaluate the effectiveness of combustion modifications as means of emissions reduction and thermal efficiency improvement on industrial combustion equipment including kilns, ovens, dryers, process furnaces and heaters, boilers, stationary engines and gas turbines.

The approach will involve a field test program to measure emissions of NO, NO_x, SO_2, SO_3, CO, gaseous hydrocarbons, particulates, trace elements, organics (POM, PCB) sulfates and nitrates. Baseline tests will be conducted on about twenty-five representative combustion devices and combustion modifications will be implemented to determine the influence on emissions and efficiency. These modifications include lowered excess combustion air, staged combustion, reduced air preheat, fuel changes, water injection and flue gas recirculation.

The program is an extension of work conducted on EPA contract 68-02-1074 that dealt with industrial boilers. Combustion modification technology that was found effective on boilers will be extended to other industrial equipment, although extensive tests on two industrial boilers equipped with staged air and/or flue gas recirculation are included.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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☐ [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	TASK NO. [illegible]	PROJECT OFFICER Robert E. Hall RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$247,713	76		1/23/76	6/77

EPA Form 5700-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. (Do not use this space)

SSIE

ZB [illegible]

TITLE OF PROJECT: Field Testing: Application of Combustion Modification to Control Pollutant Emissions from Power Generation Combustion Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. W. Bartok, Senior Research Associate, Manager of NO_x and Basic Combustion Studies

Mr. A. Crawford, Senior Engineering Associate, Gov't Research Laboratory

Mr. E. Manny, Engineering Associate, Gov't Research Laboratory

NAME AND ADDRESS OF APPLICANT INSTITUTION

Exxon Research and Engineering Company
Post Office Box 8
Linden, New Jersey 07036

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this study is to field test power generation combustion equipment including utility boilers, gas turbines, and stationary I. C. engines. Emphasis will be placed on utility boilers firing coal, but the study will include tests of gas-and oil-fired boilers and boilers capable of firing two or more fuels simultaneously. Tests with simultaneous firing of waste and fossil fuels shall also be included

Emissions to be measured are oxides of nitrogen, oxides of sulfur, hydrocarbons, carbon monoxide, carbon dioxide, oxygen, opacity, sulfates, nitrates, particulate (mass and size distribution), POM, and trace elements. The effect of combustion modification on air pollutant emissions and combustion efficiency will be determined. Also, the effect of modified operation on equipment performance (e.g. slagging, fouling, steam temperature control) will be investigated.

One primary goal is to determine the effect of staged combustion in coal-fired boilers on tube wall corrosion rates. Staged combustion combined with low excess air firing is the most attractive combustion modification combination because it is an effective method of reducing NO_x and is relatively easy and inexpensive to implement. However, some experts suspect the reducing atmosphere in the burner zone to increase tube wall corrosion rates. The Contractor will use three methods for measuring corrosion rates: (1) corrosion probes for an easy, inexpensive, but probably an inaccurate method, (2) ultrasonic tube wall measurement which is more costly but should provide an accurate mapping of the furnace tube wall surface, and (3) test panels which will be welded into the boiler tube wall in areas where extensive corrosion is anticipated. The test panels will be removed after a 6 to 12 month period for precise measurements.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		

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	[illegible]	FILE NO.	PROJECT OFFICER / RESPONSIBLE ORGANIZATION
X	[illegible]	6(P-71/3	Robert E. Hall IERL-RTP, EACH, CRB

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$703,398	76	NONE	6/26/74	10/77

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0011

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE
EPA
CDD

TITLE OF PROJECT
Combustion Research on Coal Nitrogen and Particulate Organic Matter

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

J. B. Howard, Project Manager
Adel F. Sarofim, Principle Investigator (Coal Nitrogen)
R. Hites, Principle Investigator (POM)

NAME AND ADDRESS OF APPLICANT INSTITUTION

Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, Mass. 02139

SUMMARY OF PROPOSED WORK [illegible]

Task I. Characterization of POM from Diffusion and Premixed Flames

The research is concerned with the qualitative and quantitative assessment of the production of particulate organic matter in laboratory flames. The objectives are to determine within the flame and in the exhaust gases (1) the size distribution and concentrations of soot particles, (2) the identities and concentrations of organic compounds, (3) the relationship between soot and organic compounds generated in the flame. Experimental methodology used includes particle concentration and size distribution by electron microscopy, and analysis of polycyclic aromatic hydrocarbon by gas chomatographic mass spectrometry and high resolution mass spectrometry. The major emphasis involves the application of molecular beam sampler and on-line mass spec. for complete gas phase analysis. Additional information is obtained by sampling atmospheric pressure turbulent diffusion flames and laminar premixed flames by water-injected sampling probes.

Task II Kinetics of Devolatilization of Nitrogen Compounds During the High Temperature Pyrolysis of Coal

The program objectives are to obtain a better understanding of the processes contributing to the emission of NO_x from coal fired boilers to better define control methods. Fuel bound nitrogen complicates development of low NO_x burners because the nitrogen in char may persist into the second stage of a staged combustor. During the past two years laboratory furnaces have been developed for the pyrolysis and oxidation of pulverized coal under conditions simulating utility boilers. Results on nitrogen retention in char have been determined for two coals as a function of temperature and time. Also, the conversion of the fuel nitrogen to NO has been determined as a function of fuel/air ratio for one furnace temperature. Five additional coals will be studied over a wider range of temperatures and data will [illegible] addition

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	TASK NO.	PROJECT OFFICER
[illegible]	7	J. H. Wasser
		RESPONSIBLE ORGANIZATION
		IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$180,000	76	1-year	6/74	6/77

EPA Form 5700-1 (3-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

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Form Approved [illegible]

PROJECT NO. [illegible]

[illegible]

78 CDD

TITLE OF PROJECT

Air Pollution Emission Control Development for Stationary Internal Combustion Engines

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

This program will develop a set of combustion chamber design concepts for reciprocating engines from a compilation of all available prior analytical and experimental information and from the contractor's further thorough assessment of the reciprocating combustion process. The set of design concepts will be studied and a selection process established to identify the most promising concepts utilizing mathematical modeling and/or other techniques for prediction of emissions performance. Design concepts will then be implemented and tested in an experimental facility capable of duplicating large bore reciprocating engines. Based on the evaluation of the test results, the best design concepts will be incorporated in full scale engines to develop the optimum configuration and operating conditions for application in both diesel and gas engines.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible] X [illegible]	TASK NO. 7(P-8)	PROJECT OFFICER J. H. Wasser [illegible] IERL-RTP, EACD, CAB

FUNDS OBLIGATED	F.Y. 78	[illegible] 3-year	STARTING DATE 1/77	ESTIMATED COMPLETION DATE 1/80

EPA Form [illegible] REPLACES [illegible] MAY NOT BE USED.

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NOTICE OF RESEARCH PROJECT

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[illegible]

PROJECT NO. (Do not use this space)

78 GDD

TITLE OF PROJECT

Pilot Scale Evaluation of Advanced Combustion Control Tech. for Fossil & Waste Fuels

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

L. W. Anderson - Program Manager - Environmental Engineering Systems
R. A. Brown - Principal Investigator - Energy/Environmental Sciences Dept.
H. B. Mason - Project Engineer - Energy/Environmental Sciences Dept.
J. O. L. Wendt - Consultant - University of Arizona
D. W. Pershing - Consultant - University of Arizona

NAME AND ADDRESS OF APPLICANT INSTITUTION

Aerotherm Div/Acurex Corp.
485 Clyde Avenue
Mt. View, Calif. 94042   FTS 8-[illegible]

SUMMARY OF PROPOSED WORK [illegible]

The objective of this 28-month experimental research project is to develop advanced low emission high efficiency combustion techniques for application to industrial and utility boilers firing fossil and waste fuels. Primary emphasis will be on control of oxides of nitrogen (NO_x) through modification of combustion conditions. The facility is a subscale versatile furnace, with capacity of 5×10^6 Btu/hr, capable of firing a variety of solid, liquid and gaseous fuels. The furnace may be operated either in the wall firing mode, using up to 10 individual burners, or in the tangential, corner, firing mode using up to 24 individual fuel/air nozzles. The research burners for single wall or opposed wall firing are of a variable swirl double concentric design with capacities of either 500,000 Btu/hr or 1.5×10^6 Btu/hr.

The first year effort will focus on NO_x control techniques for conventional fossil fuels, primarily pulverized coal and residual oil. Initially, the combustion characteristics of the furnace will be studied to establish the correspondence to full-scale utility and industrial boilers. Subsequent testing will optimize NO_x control through two-stage combustion, flue gas recirculation and low excess air firing for the wall fired and tangentially fired configurations. Emphasis will be given to identification of optimum staging conditions for reduction of NO_x from coal fired boilers.

The second year program will explore NO_x control techniques for the firing of mixed conventional fuels, new alternate fuels, waste fuels, and mixtures of conventional fuels with alternate or waste fuels.

PROFESSIONAL EFFORT INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		

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SUPPORT METHOD	ROAP NO.	PROJECT OFFICER
[illegible] X [illegible] [illegible]	7(P-0)	David G. Lachapelle IERL-RTP, EACD, CRB

FUNDS OBLIGATED	FY	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$318,073	75	1	6/06/75	10/06/77

EPA Form [illegible]   REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJ. NO. (Do not use this space) [illegible] 78 [illegible]

TITLE OF PROJECT

Fuel Decomposition and Flame Reactions in Conversion of Fuel Nitrogen to NO_x

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

W. H. Fulick - D/522, Advanced Programs, Project Manager
A. E. Axworthy - D/522, Advanced Programs, Principal Investigator
D. R. Kahn - D/522, Advanced Programs, Member of the Technical Staff
V. H. Dayan - D/522, Advanced Programs, Member of the Technical Staff

NAME AND ADDRESS OF APPLICANT INSTITUTION

Rocketdyne Division, Rockwell International Corporation
6633 Canoga Avenue, Canoga Park, CA 91304

SUMMARY OF PROPOSED WORK [illegible]

A eighteen-month experimental and analytical program has been initiated to provide information on fuel decomposition, fuel oxidation and flame reactions which is required for the development of a complete understanding of the chemical phenomena involved in the conversion of organic fuel nitrogen compounds to NO_x during combustion. The program is divided into three tasks. Task I consists of additional experimental studies of the types of chemical reactions that fuel nitrogen species can undergo as fuel reacts in the early (preflame) stages of combustion. The pyrolysis and oxidation of model nitrogen compounds, coals, residual oil and alternate fuels will be investigated. Task II involves the study of combustion kinetics involved in fuel NO_x formation from HCN and NH3 in premixed CH_4 flames including: 1) interactions with thermal NO_x formation; 2) more detailed analysis of nitrogen-containing species, and 3) organic nitrogen additives or diffusion flame studies. Task III will involve summarizing the data analysis and synthesizing the results into a quantitative scheme for the conversion of fuel nitrogen to NO and other pollutants.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	[illegible]	PROJECT OFFICER G. B. Martin	
X	[illegible]	7(P-A)	RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
120,650	76	0	6/13/75	12/13/76

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
O.M.B. No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]
[illegible] 76 [illegible]

TITLE OF PROJECT: Development of Catalyst and System Design Criteria for Catalytic Combustors with Application to Stationary Sources

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Dr. R. M. Kendall; Chief Corporate Scientist & Vice President/Dr. C. B. Moyer; Manager Energy and Environmental Sciences/Dr. L. W. Anderson; Manager, Environmental Engineering Systems/Dr. J. P. Kesselring; Staff Engineer, Aerothermochemistry Dept/ Mr. C. D. Hartman, Senior Project Engineer/Mr. A. J. Murphy, Staff Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION:

Aerotherm Division/Acurex Corporation
485 Clyde Avenue
Mountain View, California 94042

SUMMARY OF PROPOSED WORK [illegible]

The objective of this program is the establishment of design criteria for application of catalytical combustion to low emission, high efficiency stationary combustion systems. To accomplish this, a research and development program consisting of experimental small-scale catalyst and combustor concept screening, experimental and theoretical scale-up work for promising concepts, and design development of prototype systems based on selected concepts has been outlined.

A number of catalyst systems have been evaluated by small-scale screening experiments, under a variety of conditions and for several different fuels. Based on the results of single-component catalyst systems, one multi-component catalyst system has been developed and is being tested extensively. The most promising systems will then be further tested by integration into a practical combustion system. These small-scale tests will investigate the effects of interstaged cooling, mixing of secondary air, and bed heat removal. Data from these tests will be used to define optimum catalytic systems and specific equipment applications, and also to identify the mechanisms of catalyst performance by correlating the results with system properties and by conducting detailed analytical studies with appropriate computing techniques, accounting for flow, diffusion, homogeneous and heterogeneous reaction effects, and heat transfer. Larger-scale catalyst system and system concept development experiments will be performed for verification and further development of optimum system, and conceptual designs of promising concepts will be made.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		

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[illegible]	TASK NO.	PROJECT OFFICER / RESPONSIBLE ORGANIZATION
X [illegible]	?(P-8)	G. B. Martin IERL-RTP, PACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$21,918	76	1	6/30/76	6/30/77

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

78 GDD

TITLE OF PROJECT

Residential Oil Furnace System Optimization

J. Friedman - 578 - Program Manager
W. Nurick - 589 - Member of the Technical Staff
L. P. Combs - 589 - Member of the Technical Staff
A. Okuda - 589 - Member of the Technical Staff

NAME AND ADDRESS OF APPLICANT INSTITUTION

Rocketdyne - A Division of Rockwell International
6633 Canoga Ave., Canoga Park, CA 91304

An eighteen month analytical and experimental program has established the technology for an integrated residential furnace system to combine minimum pollutant emissions with maximum system efficiency. The program is divided into two phases. Phase I consisted of an analytical and experimental study to define the requirements of system components. Phase II involved the assembly and testing of a prototype system and the definition of an integrated residential heating system capable of NO_x emissions of less than 0.5 g NO/kg of fuel with minimum CO, UHC and smoke, and overall system efficiency which is more than 10% higher than that achieved by current conventional systems. The prototype met all goals, except that NO_x was 0.63 gm NO/kg of fuel; however, further system optimization is planned.

N/A

FOR OFFICE USE ONLY

X	TASK NO. 7(P-8)	PROJECT OFFICER G. B. Martin IERL-RTP, EACD, CRB

$38,030	76	0	STARTING DATE 6/30/74	7/30/76

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. (Do not use this space)

76 CDD

TITLE OF PROJECT

Mechanisms and Chemistry of Conversion of Fuel Nitrogen to NO

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

A. E. Axworthy, G. R. Schneider, M. D. Shuman, and V. H. Dayan

NAME AND ADDRESS OF APPLICANT INSTITUTION

Rocketdyne Division
Rockwell International
6633 Canoga Avenue
Canoga Park, CA 91304

SUMMARY OF PROPOSED WORK [illegible]

This completed contract was a coordinated experimental and analytical investigation of chemical mechanisms involved in the conversion of fuel nitrogen to NO_x in combustion. The pyrolysis of fossil fuels and model fuel nitrogen compounds was investigated, droplet and particle combustion models were developed, and premixed flat-flame burner experiments were conducted to study the conversion of HCN and NH3 to NO_x in low-pressure CH4-O2-Ar flames. Decomposition rates and products were measured in helium from 850 to 1100C for pyridine, benzonitrile, quinoline, and pyrrole; products were measured for six No. 6 fuel oils, one crude oil, and two coals. HCN was the major nitrogen-containing pyrolysis product; the amount formed increased with temperature. NH3 was a minor product and little if any N2 was formed. The burner experiments demonstrated that fuel NO forms relatively slowly above the luminous zone in the same region where CO is oxidized to CO2 or later. Although HCN and NH3 gave similar yields of NO, the NH3 reacted very early in the flame front; most of the HCN survived the luminous zone and then reacted slowly. A mechanism was proposed in which fuel NO forms via the reaction: O + NCO = NO + CO.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] 3	TASK NO. 7(P-8)	PROJECT OFFICER G. B. Martin [illegible] IERL-RTP, SACB, CRB

FUNDS OBLIGATED $8,000	F.Y. 76	[illegible] 0	STARTING DATE 6/30/72	ESTIMATED COMPLETION DATE 5/30/75

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
[illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]
SSIE
EPA
7A [illegible]

TITLE OF PROJECT

Environmental Assessment of Afterburner Combustion Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - Transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

This program will completely analyse the problem of emissions from afterburner combustion systems, assess the environmental status of these systems for current technology, and result in a standard of practice manual for applying these systems for emission control.

The contractor will prepare a research plan and review the literature and other sources of information on afterburners in the first phase of work. Based on the accumulated information and predicted estimates a preliminary environmental assessment will be made covering the present state-of-the-art for afterburners.

In the second phase, the contractor will initiate a comprehensive analytical study of actual afterburner installations in the field to obtain further data. Research lab experimental work will be done to obtain data that could not be determined by field testing. Based on this additional information, a final environmental assessment of afterburner will be made. A standard of practice manual will be prepared to enable broading the scope of application of afterburner combustion systems.

IDENTIFY PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD	TASK NO.	PROJECT OFFICER / RESPONSIBLE ORGANIZATION
X [illegible]	7(P-8)	J. H. Wasser IERL-RTP, EACD, CRB

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
	76	2-year	12/76	12/78

EPA Form 5700-1 (2-75) REPLACES [illegible] WHICH MAY NOT BE USED.

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

Fundamental Combustion Research Applied to Pollution Control

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

This contract involves the formulation and execution of a comprehensive fundamental combustion research program to provide additional insight into the features of combustion controlling the formation of pollutants in flames. In formulating the program primary emphasis is placed upon critically selecting tasks which will maximize the impact of fundamental combustion research (FCR) on commercial realization of pollution control technology. Execution of the program requires coordination with other elements of the EPA combustion research program, and work being sponsored by other government agencies and by industry. Included in the program are studies of chemical kinetics, combustion aerodynamics, numberical modelling and direct application of FCR to current problems in the Fuels R&D, Process R&D or Field Testing sections of the EPA Combustion Research Program. Additionally, a significant amount of subcontracted work is planned in order to utilize the talents, expertise and equipment at the various research establishments throughout the country.

[illegible] PROFESSIONAL SCHOOLS INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

X	SUPPORT METHOD [illegible]	FILE NO. 7(P-8)	PROJECT OFFICER W. S. Lanier IERL-RTP, EAPD, CRB

FUNDS OBLIGATED	F.Y.	[illegible] 3	STARTING DATE 8/1/77	ESTIMATED COMPLETION DATE 8/1/80

EPA Fo. [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT:
Investigation of NO_x-Nitrate-Sulfate Production in Laboratory Flames

[illegible]

D. J. Seery - Senior Research Scientist - Kinetics & Environmental Sciences Section
M. F. Zabielski - Senior Research Engineer - Spectrometry Group - Instrumentation Lab.
L. R. Dodge - Research Engineer - Spectrometry Group - Instrumentation Laboratory

NAME AND ADDRESS OF APPLICANT INSTITUTION
United Technologies Research Center
400 Main Street
East Hartford, Connecticut 06108

SUMMARY OF PROPOSED WORK [illegible]

An experimental program will be conducted to measure the concentrations of the important stable and unstable species in methane-air flames. Particular emphasis will be placed on a determination of the presence of nitrates and sulfates in the flame zone. In addition to searching for flame formed nitrates the study will devote a major effort to determining if the nitrate precursor, NO_2, is actually present in the early flame zone and if reactions are occurring in the sampling probe which perturb the actual NO/NO_2 concentration ratio. Various sampling techniques will be employed including cooled and uncooled quartz microprobes, optical spectroscopy, and molecular beam sampling for measurements of radical species and stable species with interferences. The molecular beam sampling - mass spectrometry technique will be augmented by use of the appearance potential measurements which greatly increases the number of species which can be measured. Measurements will be made over a range of stoichiometries and with the NO_x resulting from conversion of both atmospheric N_2 and fuel-bound nitrogen. One experimental series calls for doping the fuel with hydrogen sulfide and sampling to identify the presence of flame formed sulfates. This series of tests will be performed using the molecular beam sampler so that not only sulfates but also their precursors will be identified.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]
N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible] X [illegible] [illegible]	TASK NO. 7(P-8)	PROJECT OFFICER W. S. Lanier RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CSB

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$50,000	76	3	10/1/76	10/1/79

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	PROJECT NO. (DO NOT USE THIS SPACE) SSIE NO. FR [illegible]

TITLE OF PROJECT: Field Test Program to Study Staged Combustion Technology for Tangentially Fired Utility Boilers Using Subbituminous Coal

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTOR AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

R. W. Robinson, Manager of Field Testing and Performance Results Dept.
Technical Consultant

J. D. Cavers, Senior Test Engineer, Senior Project Director

NAME AND ADDRESS OF APPLICANT INSTITUTION

Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095   FTS 8-244-200; 688-1911 Ext. 2800

SUMMARY OF PROPOSED WORK [illegible]

(1) Objective - to investigate the effectiveness of employing overfire air as a method of reducing NO_x emission levels from tangentially fired boilers firing western U.S. coal.

(2) Approach -

(a) Select two suitable test units - one firing a western U.S. subbituminous coal and one firing a western U.S. bituminous coal. Both units are to be of current design incorporating overfire air registers.

(b) Perform Baseline, Biased Firing and Overfire Air Tests on both units to investigate the effect of reducing NO_x emissions with respect to related gaseous emission levels, furnace waterwall corrosion and unit performance.

(c) Based on the data analysis, estimates will be made of the degree of emissions control attainable with each coal type and a re-evaluation of cost estimates for the application of overfire air systems to new and existing units will be performed.

(3) Current plans and/or progress -

Work initiated on item (2) (a) on July 8, 1974.

IDENTIFY PROFESSIONAL'S NAME INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X	TASK NO. 7(P-6)/1	PROJECT OFFICER David G. Lachapelle RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$46,933	76	Contract Near Completion	6/28/74	12/31/76

EPA Form 5760-1 (7-73)   REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

76 [illegible]

TITLE OF PROJECT

Study of the Performance of a Thermal Aerosol Oil Burner

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - Transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

The thermal efficiency of fuel oil combustion is often limited by the amount of excess air required to maintain a low enough level of particulates (e.g., soot) in the flue gases. High soot levels that would be associated with maximum efficiency operation of oil burners, such as residential size burners, are unacceptable from pollution as well as long-term efficiency (sooting of heat transfer surfaces) considerations. The primary objective of this study is to evaluate a type of burner which may allow combustion to proceed at low excess air levels and operate closer to maximum efficiencies without the objectionally high pollution levels characteristic of conventional burners operating in this mode.

An experimental study is planned to assess soot formation limitations and operating characteristics of a thermal aerosol oil burner for combustion of #1 and #2 fuel oils. Emphasis will be placed on the characterization of the fuel oil atomization via a thermal aerosol nozzle from the viewpoint of combustion efficiency, soot formation and equipment requirements. The effect of oil temperature and pressure, inlet air temperature, fuel/air ratio, and firing rate on flame luminosity, soot particle concentration and size distribution, NO_x emission and flue temperature will be investigated.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	TASK NO. ?(P-8)/2	PROJECT OFFICER Robert E. Hall IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y. 76	[illegible] None	STARTING DATE 1/77	ESTIMATED COMPLETION DATE 1/78

EPA Form 5700-1 [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT

Design Optimization and Field Verification of an Integrated Residential Furnace

[illegible]

[illegible] : [illegible] : Program Manager
L. P. Combs : [illegible] : Member of the Technical Staff
A. S. Okuda : [illegible] : Member of the Technical Staff
[illegible] : [illegible] : Member of the Technical Staff

NAME AND ADDRESS OF APPLICANT INSTITUTION

Rocketdyne Division, Rockwell International Corporation
6633 Canoga Avenue, Canoga Park, CA 91304

SUMMARY OF PROPOSED WORK [illegible]

A 24-month program has been initiated for design optimization, construction, and field verification testing of a prototype of the low-emission, high-performance residential warm-air-oil furnace which was developed under EPA Contract 68-02-1819. The program will be conducted in two phases. The first phase will consist of analysis and laboratory testing to further optimize the furnace design and document its pollutant emissions and thermal efficiency performance. The optimum furnace's capabilities to operate with alternate fuels will also be evaluated. In preparation for the next phase, the logistics of field testing residential furnaces will be delineated. The second phase will be concerned with construction of a number of integrated furnace units to be field tested, their installation in selected residences and operation during an entire annual heating season. The emission and performance characteristics of each test unit will be determined initially and remeasured monthly. Operating conditions will not be adjusted unless required to correct an unsafe or excessive emission condition. Complete descriptions of the furnace design and capabilities will be documented in a concise form usable by furnace manufacturers as a design guide book.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	[illegible] [illegible]	PROJECT OFFICER G. B. Martin RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

[illegible] 161,000	F.Y. 76	[illegible] 2	[illegible] 9/1/76	ESTIMATED COMPLETION DATE 9/1/78

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

EPA 78 [illegible]

TITLE OF PROJECT:

Fuel Properties and Atomization for NO$_x$ Control from Heavy Liquid Fuels

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Results of package boiler burner experiments on heavy fuel oil have shown significant promise for NO$_x$ reduction; however, the effect of fuel properties and atomization parameters as related to formation of NO$_x$ and smoke has been identified as an important unquantified factor. Further understanding of these factors and their interaction with the combustion air flow under both combusting and non-reacting conditions is necessary to optimize burners.

This research project is scoped to answer some of the essential questions and includes: 1) evaluation of fuel-atomization scheme interactions on burner performance; 2) for selected nozzles determination of fuel and air flow interactions under non-reacting conditions; and 3) the effect of flame confinement on burner performance.

IDENTIFY PROFESSIONAL SOCIETY INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☒ [illegible]	TASK NO. 7(P-8)/2	PROJECT OFFICER G. B. Martin RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y. 78	NO. OF FOLLOW-ON YEARS [illegible] 1	STARTING DATE 12/1/76	ESTIMATED COMPLETION DATE 12/1/77

EPA Form 5700-1 (4-76) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

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NOTICE OF RESEARCH PROJECT F-8

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

TB [illegible]

TITLE OF PROJECT: Investigation of the Effect of Combustion Parameters on Emissions from Residential and Commercial Heating Equipment

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

David W. Locklin - Chief, Atmospheric Chemistry and Combustion Systems
Research Division, Battelle Columbus Laboratories

NAME AND ADDRESS OF APPLICANT INSTITUTION
Battelle Memorial Institute
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this investigation was to determine the effectiveness of known combustion modification techniques in controlling pollutant emissions from conventional residential and commercial heating equipment. In addition, another objective was to establish what boiler manufacturers and users could do to control emissions with existing state-of-the-art technology and where combustion research activities should be concentrated.

An experimental testing program was developed and carried out in which the effects of excess air level, load, flue gas recirculation, staged combustion, fuel temperature, burner design and similar considerations were assessed for residential and commercial furnaces and boilers of various designs fired with oil and gas. The pollutants of interest in this study were oxides of nitrogen, oxides of sulfur, hydrocarbon, carbon monoxide, smoke, and filterable and total particulate.

As a result of this investigation, reports (EPA-R2-73-084a and -084b) presented the conclusions of this field test effort which measured emissions and the effects of various combustion parameters and fuel-oil compositions for 33 residential heating units and 12 commercial boilers. Manufacturer's and operator's guideline manuals were also issued.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]: N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR:

DATE:

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]: X

TASK NO.: 7(P-01)/8.3

PROJECT OFFICER: Robert E. Hall

RESPONSIBLE FACILITY: IERL-RTP, EACD, CRB

FUNDS OBLIGATED	FY	NO. OF FUTURE YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$2,900	76	None	2/28/72	6/76

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

78 [illegible]

TITLE OF PROJECT

Source Testing of Coal-Oil Slurry Fired Boiler

NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

David W. Locklin - Chief, Atmospheric Chemistry and Combustion Systems Research Div.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle-Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this study is to perform measurements of polycyclic organic matter (POM) and sub-micron particulate on a boiler firing oil and coal-oil slurry to more thoroughly evaluate the environmental impact of the utilization of coal-oil slurries as fuels. The contractor is already involved in the measurement of a wide range of pollutants on a planned test program so this effort is in an extension of other work.

This work involves the coordination of measurements of POM and sub-micron particulate (0.01μm to 1μm) with planned tests on a 500,000lb steam/hr boiler firing oil only and a coal-oil slurry. The measurements shall be taken under full load baseline (oil only) conditions and at full load when firing the slurry. The tests shall be coordinated so that data from simultaneous measurements of NO_x, CO, HC, SO_x, particulate and opacity will be available. A final report summarizing the work will be prepared.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 7(P-8)/3	PROJECT OFFICER Robert E. Hall RESPONSIBLE ORGANIZATION IERL-RTP, E'CD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$35,118	76	None	4/76	10/76

EPA Form 5700-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE

76 [illegible]

TITLE OF PROJECT

Low Emission Burner for Package Boilers

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED ON PROJECT

Dr. [illegible], Project Director
Dr. [illegible]
Dr. [illegible]
Mr. V. [illegible]
Mr. G. [illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

Ultrasystems, Inc.
2400 Michelson Drive
Irvine, Ca. 92664

SUMMARY OF PROPOSED WORK [illegible]

Commercial and industrial package boilers consume approximately 30% of the nation's fuel and produce about 8% of the NO_x. Previous studies have shown that NO_x formation is a burner phenomenon and that reductions of approximately 50% to 80% can be realized by modifying the combustion process. It is the premise of this study that these reductions can be accomplished through revised burner designs as opposed to external flue gas reduction or staged air injection.

The experimental results indicate that it is possible to effect NO_x reduction of 60 to 70% for a variety of nitrogen containing residual fuel oils by modification of fuel-air mixing history. The study has identified the oil atomizer as an important element of the design for reducing NO_x without increased carbon losses.

It is anticipated that an optimum burner will be tested on a field operating package boiler.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 7(P-B)/3	PROJECT OFFICER G. B. Martin RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS TENTATIVELY SCHEDULED BEYOND CURRENT F.Y.	STARTING DATE	ESTIMATED COMPLETION DATE
67,750	76	0	6/30/74	6/30/77

EPA Form 5700-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Combustor Design Concepts for NO_x Control - Advanced LBG Fired Systems

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - Transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Utilization of low Btu gas (LBG) in an environmentally acceptable and energy efficient manner requires careful attention to overall system design. While most system aspects are being extensively considered, the combustor for utilization of high temperature, nitrogen compound containing LBG without production of high levels of NO_x and other pollutants has not been given sufficient attention. Preliminary calculations performed on EPA contract 68-02-1361 indicated significant promise for control of thermal and fuel NO_x by proper combustion design. This program will substantiate these concepts through a coordinated study including: 1) combustor design calculations; 2) bench scale experiments; and 3) design and fabrication of two prototype combustors for testing at the IERL-RTP laboratory.

IDENTIFY ADDITIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible] X	TASK NO. 7(B-B)/4	PROJECT OFFICER G. B. Martin RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y. 78	[illegible] 1	STARTING DATE 10/1/78	EXPECTED COMPLETION DATE 4/1/79

EPA Form 5540-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0081

PROJECT NO. [illegible]
78 [illegible]

TITLE OF PROJECT
Advanced Combustion Systems for Stationary Gas Turbine Engines

[illegible]
S. A. Mosier, Program Manager, Senior Assistant Project Engineer, Applied Res. Dept.

R. M. Pierce, Deputy Program Manager, Senior Experimental Engineer, Applied Res. Dept.

[illegible]
Pratt & Whitney Aircraft Division/United Technologies Corporation
Florida Research & Development Center
P. O. Box 2691
West Palm Beach, Florida 33402

[illegible]

An exploratory development program of analysis and experimentation will be conducted to identify new stationary gas turbine combustion designs which reduce pollutant emissions. Primary emphasis will be placed upon control of the oxides of nitrogen (NO_x) from both the thermal and fuel - bound sources, via dry techniques, while at least maintaining current control of carbon monoxide (CO) and unburned hydrocarbon (UHC).

The program is divided into four phases:
(1) a review of the various combustor design approaches; (2) screening experiments of the various techniques; (3) design of full-scale combustors for a nominally 25 MW stationary gas turbine engine; (4) evaluation of the full-scale combustors in both test rigs and in an engine.

Through the performance of all four phases, the NO_x concentration goals for the combustor designs are 50 ppmv when burning gas or oil containing no more than trace quantities of bound nitrogen and 100 ppmv when burning oil containing up to 0.5% (by weight) of chemically bound nitrogen. The CO concentration goal is 100 ppmv regardless of the fuel type.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A		

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X [illegible]	[illegible] 7(P-R)/4	PROJECT OFFICER W. S. Lanier RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
450,000	76	1	12/15/75	4/15/79

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT

Burner Design Criteria for Current and Future Gaseous Fuels

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

D. H. Larson, Project Manager
D. R. Shoffstall, Technical Supervisor

NAME AND ADDRESS OF APPLICANT INSTITUTION

Institute of Gas Technology
3424 South State Street
IIT Center
Chicago, Ill. 60616 FTS 8-409-567-3813

SUMMARY OF PROPOSED WORK [illegible]

The objective of this study is to combine the background and experience from previous IGT program and to conduct carefully planned additional experiments to produce optimum low-emissions burner design criteria for the major burner classes. The study will establish the relative controls available through the various burner designs and classical modification techniques as well as establish what operation parameters will be changed. The specific result of this program will be to establish alternative control strategies for gas systems. It will also provide a basis for low-pollution design criteria with other fossil fuel systems including low-Btu gases at ambient and elevated delivery temperatures.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	ROAP NO. 7(P-8)/4	PROJECT OFFICER David G. Lachapelle IERL-RTP, EACD, CRB

FUNDS ALLOCATED	F.Y.	STATUS	STARTING DATE	ESTIMATED COMPLETION DATE
$113,884	76	Contract Nearing Completion	6/30/75	12/31/76

EPA Form 5780-1 (7-73) [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	PROJECT NO. [illegible] 76 [illegible]

TITLE OF SUBJECT: Development of Scale-up Criteria for Burner Design and Application to Industrial Utility Boilers

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Dr. M. P. Heap, Project Director
Dr. T. J. Tyson
Dr. G. [illegible]
Mr. R. [illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

Ultrasystems, Inc.
2400 Michelson Drive
Irvine, CA 92664

SUMMARY OF PROPOSED WORK [illegible]

The objective of the project is to arrive at design criteria for low emission burners for application to industrial and utility boilers and to establish scale up criteria allowing application of the concepts to a variety of source sizes. The emphasis is placed on pulverized coal.

The approach is based on small scale (5×10^6 Btu/hr) experimental studies showing the potential for reducing NO_x levels from pulverized coal burners to the 100-200 ppm level (from 800). This study utilized a combined experimental and theoretical program to provide criteria for scaling these concepts to sizes of practical interest ($100\text{-}200 \times 10^6$ Btu/hr). The experimental program will provide the data to derive the criteria and to assess multiple burner interaction effects.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 7(P-01/6	PROJECT OFFICER G. B. Martin RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$400,000	76	1	6/30/74	10/30/77

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE 78 (13)

TITLE OF PROJECT

Long Term Corrosion Tests of Optimized Boiler Combustion Modifications

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - Transaction Incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

Objectives: Conduct long term studies on specific boiler types and coals to quantitate the effects of optimized low-NO$_x$ operation from new utility boiler designs on corrosion, slagging, unit efficiency and reliability. Special emphasis is to be given to the effect of NO$_x$ combustion modification on waterwall corrosion.

Approach: Three corrosion measurement techniques, i.e., corrosion probes, ultrasonic tube wall thickness and replaceable wall tube sections with complete metallographic before and after characterization will be utilized. Testing will be performed on four (4) new coal-fired boilers designed to meet the NO$_x$ New Source Performance Standard.

Current Plans: Procurement in progress.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO.	PROJECT OFFICER
X [illegible]	7(P-8)/7	David G. Lachapelle IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
	78	1	1/77	6/80

EPA Form 5700-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE

EPA

FB 87383

TITLE OF PROJECT: Evaluation of the Use of Low Sulfur Western Coal in Existing Small and Intermediate Size Boilers

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Mr. H. R. Bartz, General Manager, KVB Engineering, Inc.
Dr. K. L. Maloney, Project Manager, KVB Engineering, Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION

KVB Engineering, Inc.
17332 Irvine Blvd.
Tustin, CA 92680

FTS 8-796-2011
714-832-9020

SUMMARY OF PROPOSED WORK [illegible]

Objectives: Demonstrate the environmentally sound use of western coal in combustion systems presently utilizing bituminous coals. Evaluate the emissions and unit performance aspects of converting combustion systems to western coal. Provide application guidelines and evaluate the cost effectiveness of utilizing western coals to their maximum extent consistent with viability and economics.

Approach: Ten boilers selected on the basis of design type and size will be systematically tested with each of two coal types corresponding to the design (Eastern) coal and a Western coal. Emissions (NO_x, SO_2, CO, HC and particulates) will be measured. Unit efficiency and the degree of convertibility will be assessed.

Current Plans: Work initiated on February 14, 1975

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	TASK NO. 1(P-81)/6	PROJECT OFFICER David G. Lachapelle RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$215,400	76	Contract Fully Funded	Feb 14, 1975	6/77

EPA Form 5700-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

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[illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

76 CDD

TITLE OF PROJECT

Effects of Fuel Sulfur on Nitrogen Oxide Formation in Combustion Processes

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. J. O. L. Wendt, Associate Professor of Chemical Engineering

NAME AND ADDRESS OF APPLICANT INSTITUTION

Chemical Engineering Department
University of Arizona
Tucson, Arizona 85721

SUMMARY OF PROPOSED WORK [illegible]

The objective of this research is to determine the effect of fuel sulfur on the formation of nitrogen oxides in combustion processes. In work previously sponsored by EPA at the University of Arizona it was shown that in a laboratory premixed gas flame, the addition of SO_2 or H_2S to the fuel significantly inhibits the formation of thermal NO_x. Specifically, it was found that the equivalent of about 3000 ppm SO_2 in the exhaust could result in thermal NO reductions of between ten and twenty percent, but that the greatest effect was present when SO_2 concentrations were high on the fuel lean side of the flame front. Work to be accomplished during the second phase of this research is to conduct more fundamental studies involving premixed flames, well defined diffusion flames and to determine the mechanisms controlling interactions between sulfur and nitrogenous species. The ultimate objective is to interpret pilot scale data from a fundamental point of view and to extend these results to combustion in general.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	TASK NO. [illegible]	PROJECT OFFICER W. S. Lanier [illegible] IERL-RTP, [illegible]

[illegible] $65,000	F.Y. 75	[illegible] 1	STARTING DATE 4/1/75	ESTIMATED COMPLETION DATE 6/31/76

EPA Form [illegible] REPLACES [illegible]

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

CODE [illegible]

TITLE OF PROJECT

Study of the Performance of a Thermal Aerosol Oil Burner

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

[illegible], Sr. Principal Research Scientist, Principal Investigator
[illegible], Principal Research Scientist
J. [illegible], Sr. Staff Scientist
A.[illegible], Associate Research Scientist
[illegible], Research Associate

[illegible] America Co. Crystal Bay, Minnesota
Dr. J. B. Howard, MIT, Consultant
Dr. R. Flagan, MIT, Consultant

NAME AND ADDRESS OF INSTITUTION
Honeywell Inc., Corporate Research Center
10701 Lyndale Ave S
Bloomington, MN 55420

SUMMARY OF PROPOSED WORK — [illegible]

1. To determine if and under what operating conditions a thermal aerosol oil burner is suitable for combustion of light fuel oils at simultaneous low levels of excess air (high efficiency) and stack combustibles.
2. Investigate the effect of oil pressure, temperature and droplet size; inlet air temperature; fuel/air ratio and firing rate; on flame luminosity; soot particle concentration and size distribution; NO_x emission, and flue temperature.
3. Preliminary experiments have shown that the subject burner is capable of supporting a blue flame without visible smoke. The potential for low excess air combustion stems from the fact of the very fine atomization achievable with such burners without requiring costly equipment to generate very high oil pressures or compressed air. Calculations, verified experimentally have shown that substantial fuel savings are possible when currently used excess air levels are reduced to the 10-20% level.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] Not-for-profit industrial research center	SIGNATURE OF PRINCIPAL INVESTIGATOR [illegible]	DATE [illegible]

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SUPPORT METHOD [illegible] [illegible] ✓ [illegible] CONTRACT [illegible]	TASK NO. 8	SPONSORING OFFICE [illegible] SPONSORING ORGANIZATION EPA, [illegible]	[illegible] Triangle Park, NC
FORM DESIGNATION [illegible]	F.Y. 76	[illegible] STARTING DATE 9/27/76	DATE OF COMPLETION 9/26/77

EPA Form [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
[illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

EPA
OED

TITLE OF PROJECT: A Survey of Emissions Control Combustion Equipment Data in Industrial Process Heating

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

D. H. Larson, Engineering Research, Manager
M. B. Pojer, Engineering Research, Associate Chemist
J. D. Nesbitt, Consulting Engineer

NAME AND ADDRESS OF PERFORMING INSTITUTION:
Institute of Gas Technology
3424 South State Street
Chicago, Illinois 60616

SUMMARY OF PROPOSED WORK [illegible]

The overall objective of the proposed program is to identify the significant emission sources within the industrial process combustion field, to investigate the potential for effective emissions control for industrial process combustion, and to compile information on combustion equipment in use and future trends in potential energy conservation measures and emission control programs, assess the potential for R&D work to advance emissions control, and recommend R&D programs to solve the problems involved.

The objectives of this program will be achieved by :

1. Establishing the potential for energy conservation and reduction in emissions in several major energy-intensive industries.
2. Relating the existing and potential energy conservation technology to emission control requirements and implementation technology through a series of field interviews.
3. Identifying existing and potential problems areas and subsequently recommending specific research and implementation programs as required and identifying potential sponsors for such programs.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICIAL USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO. 8	PROJECT OFFICER J. H. Wasser RESPONSIBLE ORGANIZATION IERL RTP, CACD, CPB

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$7,000	74	0	6/74	8/75

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE USE
CDD

TITLE OF PROJECT

Combustion Control Technology for Conventional Combustion Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

David G. Lachapelle
Environmental Protection Agency
IERL-RTP

NAME AND ADDRESS OF APPLICANT INSTITUTION

EPA, IERL-RTP

SUMMARY OF PROPOSED WORK [illegible]

Objective: Develop technically and commercially feasible combustion control technology for application to package boilers and other area sources.

Approach: The approach provides for evaluation of emissions and performance of new, modified and prototype burners fired with liquid or gaseous fuels. In general, burners having the potential for low emissions and efficiency will be characterized. When possible, modifications to these burners will be made to further improve emissions performance and efficiency. Additionally, the capabilities of the versatile furnace can be utilized as a test stand for evaluating scale-up criteria and interchange of burners of comparable size to test the effects of furnace geometry and heat removal patterns.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR David G. Lachapelle	DATE [illegible]

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SUPPORT METHOD [illegible] A	TASK NO. 10	PROJECT OFFICER David G. Lachapelle IERL-RTP, EACD, CRB

FUNDS OBLIGATED 100,000	F.Y. 76	[illegible] Continuing In-House Project	STARTING DATE 8/73	ESTIMATED COMPLETION DATE Continuing

EPA Form 5760-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)
SSIE
EPA
78 COD

TITLE OF PROJECT
Source Assessment

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT
R. E. Opferkuch

NAME AND ADDRESS OF APPLICANT INSTITUTION
Monsanto Research Corporation
1515 Nicholas Road
Dayton, Ohio 45407

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to assess the emissions from the firing of pulverized bituminous coal in; (1) dry bottom industrial boilers, furnaces, and combustion equipment and (2) dry bottom utility boilers and related equipment to provide EPA with adequate background information to evaluate the need for development of emission control technology for these sources. Assessment will include investigation of air, water, and residue emissions from these units to the environment.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]
N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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SUPPORT METHOD [illegible]
X [illegible]

TASK NO
10IP-111/0

PROJECT OFFICER
D. A. [illegible]

RESPONSIBLE ORGANIZATION
IERL/RTP/IPD/CPS

FUNDS OBLIGATED
$599,079

F.Y.
76

[illegible]

STARTING DATE
April, 1976

ESTIMATED COMPLETION DATE
June 1977

EPA Form 5780-1 (2-73) REPLACES [illegible] WHICH MAY NOT BE USED

☆ U.S. GOVERNMENT PRINTING OFFICE: [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY	Form Approved OMB No. [illegible]
NOTICE OF RESEARCH PROJECT B-11	PROJECT NO. (Do not use this space)
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	SSIE GPO 78 CDD

TITLE OF PROJECT

Emissions Assessment of Conventional Combustion Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

R. A. Venezia, EPA Project Officer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Interim - to be selected.

SUMMARY OF PROPOSED WORK — [illegible]

This project will fill the major gaps in the air, water, and solid waste emission data base for conventional combustion systems. The emissions will be investigated on a unit operations level, (e.g. fuel storage, combustion, waste disposal, etc.) including specifying the physical and chemical state in which the pollutant is emitted (i.e. vapor, aerosol, adsorbed gas, liquid suspension, element or compound). The emission rates of the pollutants will be determined by the most appropriate means, such as field sampling, material balance calculations, or manipulation of existing data.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT [illegible] X [illegible]	TASK NO. 10IP-111/0	PROJECT OFFICER R. A. Venezia RESPONSIBLE ORGANIZATION IERL/RTP/IPD/CPB

FUNDS REQUESTED N/A	F.Y. 78	NO. OF PERSON-YEARS [illegible] 2	STARTING DATE	ESTIMATED COMPLETION DATE 1/78

EPA Form 5730-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT B-11

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Air, Water, and Solid Residue Prioritization Models for Conventional Combustion Sources

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

E. C. Eimutis

NAME AND ADDRESS OF APPLICANT INSTITUTION

Monsanto Research Corporation
1515 Nicholas Road
Dayton, Ohio 45407

SUMMARY OF PROPOSED WORK [illegible]

The report describes mathematical models that were developed to relatively rank the environmental impact of water and solid residue emissions. The water model, similar to an air prioritization model developed in an earlier study, is based on mass emission, hazard potential of the emission, ambient water loading, and population density in the emission region. Solid emissions were divided into air and water emission components and these contributions were incorporated into air and water prioritization models. The report gives the relative ranking resulting from the application of the models to 58 conventional stationary combustion sources.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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X	[illegible]	TASK NO. 1NIP-111/3	PROJECT OFFICER Ronald Venezia RESPONSIBLE ORGANIZATION IERL/RTP/IPB/CPB

FUNDS OBLIGATED $60,110	FY 76	[illegible] N/A	STARTING DATE Aug 1975	ESTIMATED COMPLETION DATE July 1976

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

OMB No. [illegible]
PROJECT NO. [illegible]
SSIE
EPA
CDD

TITLE OF PROJECT: Field Testing: Application of Combustion Modification Technology to Industrial Combustion Equipment

[illegible]

Dr. D. A. Barts, General Manager, KVB, Inc.

Mr. S. C. Hunter, Project Manager, KVB, Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION:
KVB, Inc.
17332 Irvine Blvd.
Tustin, CA 92680

SUMMARY OF PROPOSED WORK [illegible]

The program objective is to evaluate the effectiveness of combustion modifications as means of emissions reduction and thermal efficiency improvement on industrial combustion equipment including kilns, ovens, dryers, process furnaces and heaters, boilers, stationary engines and gas turbines.

The approach will involve a field test program to measure emissions of NO, NO_2, SO_2, SO_3, CO, gaseous hydrocarbons, particulates, trace elements and organics (POM,PCB). Baseline tests will be conducted on about twenty-five representative combustion devices and combustion modifications will be implemented to determine the influence on emissions and efficiency. These modifications include lowered excess combustion air, staged combustion, reduced air preheat, fuel changes, water injection and flue gas recirculation.

The program is an extension of work conducted on EPA Contract 68-02-1074 that dealt with industrial boilers. Combustion modification technology that was found effective on boilers will be extended to other industrial equipment.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 8/10/76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible] ☐ [illegible]	TASK NO. 11	PROJECT OFFICER Robert E. Hall RESPONSIBLE ORGANIZATION IERL, EPA, Research Triangle Park

FUNDS [illegible] 616,041	F.Y.	[illegible]	STARTING DATE 6/25/76	EXPECTED COMPLETION DATE 01/01/77

EPA Form 5760-1 [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

SSIE

CDD

TITLE OF PROJECT

Characterization and Design Evaluation for Commercial Combustion Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Robert E. Hall - Project Engineer, Combustion Research Branch
Energy Assessment and Control Division

NAME AND ADDRESS OF APPLICANT INSTITUTION

U.S. Environmental Protection Agency
Industrial Environmental Research Laboratory
Research Triangle Park, N. C. 27711

SUMMARY OF PROPOSED WORK [illegible]

This in-house project is designed to provide the capability for fast response testing of commercially available and prototype combustion equipment and combustion improving devices. Measurements include oxides of nitrogen, oxides of sulfur, carbon monoxide, hydrocarbons, oxygen, carbon dioxide, smoke, and particulates (mass and size distribution). In some tests efficiency measurements are made.

Test equipment includes a residential warm-air furnace rated at 100,000 Btu/hr, a Scotch marine package firetube boiler rated at 2,400,000 Btu/hr, and a firebox firetube package boiler rated at 1,440,000 Btu/hr. Fuels include natural gas, distillate oil, and low sulfur residential oil.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (if any): N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD: X [illegible]

TASK NO.: 11

PROJECT OFFICER: Robert E. Hall, IERL-RTP, EACD, CRB

FUNDS ALLOCATION: $80,000

F.Y.: 78

[illegible]: Four

STARTING DATE: 8/74

ESTIMATED COMPLETION DATE: 9/80

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

CDD

TITLE OF PROJECT

Evaluation of Fundamental Combustion Phenomena

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

W. S. Lanier - Project Officer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Combustion Research Branch
Industrial Environmental Research Laboratory
Research Triangle Park, N. C. 27711

SUMMARY OF PROPOSED WORK [illegible]

The research activities being persued under this EPA in-house program fall into two categories: 1) combustion aerodynamics and 2) chemical kinetics. In the combustion aerodynamics category, studies are underway to define the influence of external combustor and burner variables on the flow field structure. Specifically, a laser doppler velocimeter is being used to map the velocity and turbulence field in a simulated furnace. External variables being investigated are the burner confinement ratio, air swirl level, inlet swirl angle and inlet air velocity level. The data so generated will be compared to predicted values from appropriate computer programs. In the chemical kinetics category, primary activity centers around the use of computer codes to analyze kinetic data and to define the mechanisms for the formation of NO_x. An experimental facility is also under construction which will allow for quick response evaluation of interesting kinetic phenomena

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY) N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible]	TASK NO. 11	PROJECT OFFICER W. S. Lanier RESPONSIBLE ORGANIZATION IERL-RTP, EACD, CRB

FUNDS OBLIGATED 60,000	FY 76	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE 1980

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

EPA-IAG-[illegible]-E681-BAH

TITLE OF PROJECT: Support Studies of Pollutant and Waste Control in Fluidized-Bed Combustion/Regeneration Processes

NAMES, DEPARTMENTS, AND [illegible] OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT: A. A. Jonke, Project Director, Chemical Engineering Division (CEN), Associate Division Director; G. J. Vogel, CEN, Group Leader; I. Johnson, CEN, Group Leader; W. Swift, CEN, Chemical Engineer; J. Montagna, CEN, Chemical Engineer; J. Lenc, CEN, Chemical Engineer; R. Snyder, CEN, Chemical Engineer; S. Lee, CEN, Chemical Engineer; J. Shearer, CEN, Chemist

NAME AND ADDRESS OF APPLICANT INSTITUTION

Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

SUMMARY OF PROPOSED WORK — [illegible]

These ongoing studies support the development program for atmospheric and pressurized fluidized-bed coal combustion plants. Objectives of the laboratory and bench-scale studies are to obtain information on the type and quantity of emissions from combustion and regeneration processes, the methods of controlling volatile emissions when practicable, and methods for reducing the solid waste burden of sulfated limestone from the combustion system.

In laboratory-scale studies, several approaches will be investigated to reduce the quantity of sulfated limestone discharged from the system. Tests are continuing on regeneration methods other than reductive decomposition for converting sulfated limestone to lime for reuse in the combustion process. Also, scoping studies are being completed on selecting the best synthetic SO_2 sorbent and the methods of preparing it. A synthetic sorbent consisting of CaO impregnated on alumina is being exhaustively tested. This sorbent is expected to have an attrition rate less than natural stones during processing, thereby lowering solids losses from the system. Information obtained in testing the physical properties of synthetic sorbents may also be useful in modifying the structure of naturally occurring stones and thereby increasing their useful cycle lifetime. Interactions of sorbent with coal ash which reduce the reactivity of the sorbent will be studied. In other laboratory studies, the mechanism of NO_x formation in the combustion process will be explored. A literature survey of the NO_x emission problem has been completed. The fates of trace elements introduced to the process in the coal and limestone will be determined for those elements that are biologically hazardous and those that are corrosive to metal equipment. Methods of minimizing the release of these elements will be explored.

In bench-scale studies, better regenerative processes and equipment configurations developed in laboratory-scale studies will be tested. A large batch of synthetic sorbent is being prepared for cyclic combustion/regeneration studies. The fates of trace elements in the regeneration and combustion process is being determined.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
		[illegible]

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SUPPORT METHOD (Check one)	TASK NO.	PROJECT OFFICER
[illegible]	1-13	[illegible]
		RESPONSIBLE ORGANIZATION
		ERDA, Argonne National Lab.

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
3200	76	[illegible]	4/76	9/77

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

SSIE
EPA

EPA-IAG-D5-E721-BBA

TITLE OF PROJECT: Processing Studies from Lime/Limestone Wet Scrubbing Processes for Disposal or Recycle and Studies on Disposal of Fluidized Bed Combustion Waste Products

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

James L. Crowe, TVA, 1140 Commerce Union Bank Building, Chattanooga, Tennessee 37401

Telephone: 615/755-2401
FTS/854-2301

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority
Knoxville, Tennessee

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this program are as follows:
(1) To define the variables in pilot plant production of fertilizer from scrubber product sludge, to study the compatibility factors involved in storage and mixing of this fertilizer material with conventional fertilizer, to analyze for trace elements and potential toxic species in this type of fertilizer, and to determine the marketing and production cost of this type of material; (2) to determine the range of variability of solids in sludges produced from the Shawnee scrubbers and to correlate this variability with plant and scrubber operating conditions; (3) to provide a detailed chemical and physical characterization of waste bed material produced by fluidized-bed combustors and an evaluation of disposal methods for this material; (4) to characterize slurries and sludge solids from the Louisville Gas & Electric scrubber test program and to correlate these sludge characteristics to operational conditions; (5) to identify the limiting factors in combining mine wastes with scrubber sludges in admixtures which will support vegetation and in turn can be utilized to reclaim waste disposal sites; (6) to chemically and physically characterize solid waste material produced from coal cleaning processes and an evaluation of disposal methods for this solid waste.

Currently, the characterization studies of sludges obtained from Shawnee are ongoing and data is being statistically analyzed. Characterization of waste solids produced by the fluidized bed combustion process is also in process. Operation of the pilot scale preneutralizer and the pilot plant granulation unit is scheduled to begin during the transition period. Following attainment of steady state operation, production will begin to produce a fertilizer for storage, compatibility, and agronomic testing. Tasks concerning slurry and solids characterization for the Louisville Gas & Electric scrubber test program, studies to develop techniques for revegetation of SO_2 waste disposal ponds, and characterization of solid waste from coal cleaning processes will also be initiated during FY 1977.

SPECIFY PROFESSIONAL DEGREE INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR James L Crowe	DATE 8-27-76

FOR AGENCY USE ONLY

SUPPORT METHOD [illegible] X [illegible]	TASK NO.	PROJECT OFFICER James L. Crowe RESPONSIBLE ORGANIZATION Power Research Staff, TVA

FUNDS ALLOCATED	F.Y.	APPROXIMATE DURATION OF SUPPORT	STARTING DATE	ESTIMATED COMPLETION DATE
$150 K	1976	5 years	May 7, 1975	March 1980

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

[illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]
EPA-IAG-D5-E721-[illegible]

TITLE OF PROJECT
Characterization of Effluents from Coal-Fired Utility Boilers

[illegible]

Dr. R. G. McKinney, Supervisor, Environmental Research Section, 1320 Commerce Union Bank Building, Chattanooga, Tennessee 37401 Telephone 615/755-3381, FTS/854-3381
Dr. H. B. Flora, II, Chemical Engineer, Environmental Research Section, 1320 Commerce Union Bank Building, Chattanooga, Tennessee 37401 Telephone 615/755-3381, FTS/854-338

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority
Knoxville, Tennessee 37902

SUMMARY OF PROPOSED WORK [illegible]

The objectives of this project are to (1) characterize and quantify the chemical and physical components of coal pile drainage, (2) assess and quantify the chemical and physical nature of ash pond effluent after the pH of the ash pond has been adjusted to meet existing standards, (3) evaluate an ash pond monitoring program to determine the sampling necessary to obtain reliable, representative information, (4) assess and characterize coal ash leachate on ground water, (5) evaluate and quantify the chlorinated effluent in the discharge canal of a once-through cooling system, and (6) characterize the gaseous and particulate emissions from two plants with different type units, e.g. cyclone and tangential fired units.

The project will focus on determining the quantities of some trace elements in various locations in and around the power plant. The samples will be analyzed for such trace elements as mercury, cadmium, chromium, selenium, arsenic, and about eight to ten other trace elements.

Current plans include continuation of an integrated sampling program on the coal pile drainage, ash pond discharge, chlorinated effluent, coal ash leachate, and the gaseous emissions including fine particulate.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR R. G. McKinney	DATE [illegible]

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SUPPORT METHOD [illegible] X [illegible]	TASK NO. 6	PROJECT OFFICER R. G. McKinney and H. B. Flora, II RESPONSIBLE ORGANIZATION Power Research Staff, TVA

FUNDS OBLIGATED	F.Y.	NO. OF YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$350 K	1976	3 years	May 1975	December 1979

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

EPA-IAG-D5-E721-[illegible]

TITLE OF PROJECT

Fly Ash Characterization and Disposal and Studying Water Reuse or Recycling

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Shirley S. Ray, Research Analyst,
Power Research Staff, TVA
1300 Commerce Union Bank Building
Chattanooga, Tennessee 37401

Telephone: [illegible]
[illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority
Knoxville, Tennessee

SUMMARY OF RESEARCH [illegible]

The purposes of this project are to chemically and physically characterize ashes and their waste effluents and to examine fly ash handling systems, disposal and utilization methods, and treatment methods for water reuse. Work balanced around several facilities having different boiler systems and coals may be incorporated to determine the differences in ash and effluent characteristics with variation in boiler design, operation, or coal type. The scope of this project includes summarizing available information on ashes and effluents, wet and dry handling systems, disposal and utilization of fly ash, and methods of treatment for water reuse; characterizing ashes and effluents of several plants; studies on disposal alternatives and specific ash problems; and studies on processes for reusing or recycling wastewater streams from coal-fired power plants.

A draft report, "Characterization of Ash From Coal-Fired Power Plants," has been prepared and sent to the Environmental Protection Agency for review and approval. A three-day preliminary sampling program on one unit was conducted at Colbert Steam Plant in October 1975 to test procedures, equipment, and personnel. Sampling points were the coal scales, pulverizer, mechanical collector and electrostatic precipitator ash hoppers, pyrite hopper, inflow water, and sluice waters for flyash, bottom ash, and pyrites. An eight-day sampling program was conducted at Colbert Steam Plant in August 1976. The gas stream, both before and after the electrostatic precipitator, was sampled in addition to those points sampled in the preliminary testing program. These samples are now being chemically and physically analyzed.

Plans for this fiscal year are to begin the study of processes for reusing or recycling wastewater streams from coal-fired power plants; to evaluate the data from the first full-scale sampling program to characterize ashes and ash effluents; to conduct another 8-day sampling program at Kingston Steam Plant; and to summarize methods of treatment for water reuse.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Shirley S. Ray	DATE 9/07/76

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SUPPORT METHOD X [illegible]	TASK NO. 2	PROJECT OFFICER Shirley S. Ray RESPONSIBLE ORGANIZATION Power Research Staff, TVA

FUNDS ALLOCATED $100K	F.Y. 1976	[illegible] 3 years	STARTING DATE June 1975	ESTIMATED COMPLETION DATE December 1979

EPA Form 5700-1 (7-72) [illegible]

E. SYNTHETIC FUELS

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OMB No. 158-R0011

PROJECT NO. (Do not use this space)

76 EDC

TITLE OF PROJECT

Environmental Assessment of Fuel Gas/Combined Cycles

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Fred L. Robson; Chief, Utility Power Systems

NAME AND ADDRESS OF APPLICANT INSTITUTION

United Technologies Research Center
400 Main Street
East Hartford, Conn. 06108

SUMMARY OF PROPOSED WORK [illegible]

The objective of the work is to perform an environmental assessment of fuel gas generation/combined cycle power generation. This will be accomplished via paper studies which utilize the latest gasifier performance data and effluent discharges data. Air and oxygen blown gasifiers will be evaluated as well as fluidbed and molten salt types. The program will provide a comparison of these gasifiers on both an environmental and economic basis when operating in an integrated coal gasification-advanced cycle power generating system.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible]	TASK NO. 102-U	PROJECT OFFICER William J. Rhodes IERL-RTP

FUNDS OBLIGATED $312,000	F.Y. 76	[illegible] Zero	STARTING DATE 6/76	ESTIMATED COMPLETION DATE 12/77

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

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PROJECT NO. [illegible]

CDC

TITLE OF PROJECT: Control Technology Development for the Products and By-Products of Fuel Conversion/Fuel Utilization Systems

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

[illegible]	Engineering Dept.	Project Manager
[illegible]	Engineering Dept.	Process Engineer
[illegible]	Engineering Dept.	Process Engineer
A. Ahmed	Engineering Dept.	Process Engineer
[illegible]	Engineering Dept.	Process Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION:

Catalytic, Inc.
Centre Square West
1500 Market Street
Philadelphia, Penna. 19102

SUMMARY OF PROPOSED WORK [illegible]

Catalytic, Inc. shall conduct a program that will result in the development of technology for the control of environmental pollution from utilization of the products and by-products of fuel conversion/fuel utilization systems based on coal. The objective of this project is to assess the degree of removal and recovery or destruction of contaminants that can occur during processing for upgrading the products and by-products to make them suitable for marketing. Products of fuel systems are defined to encompass the primary marketable materials from fuel systems. By-products of fuel systems are defined to encompass all other useable or potentially useable components of a fuel system output slate. Fuel system products or by-products which either (1) are totally consumed within the basic production system (as for steam-raising) or (2) are totally consumed as a petrochemical feedstock shall not be considered for control technology development.

IDENTIFY PROFESSIONAL SCHOOL [illegible] Not applicable	SIGNATURE OF PRINCIPAL INVESTIGATOR [illegible]	DATE Sept. 12, 1974

FOR AGENCY USE ONLY

SUPPORT METHOD [illegible]	TASK NO. [illegible]	PROJECT OFFICER Mark J. Stutsman Environ. Research Lab. RTP, NC.
FUNDS [illegible] 1,964,938	FY 76	[illegible] 2
STARTING DATE 7 Sept., 1974	[illegible] 9/6/74	

EPA Form [illegible] REPLACES [illegible] MAY NOT BE USED.

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

[illegible]

TITLE OF PROJECT

Test and Evaluation of a Pilot Plant Coal Gasifier - Gas Cleaning Facility

[illegible]

Dr. J. K. Ferrell, Principal Investigator, Dr. W. C. Griffith, Dr. R. M. Felder, Dr. R. W. Rousseau, Dr. Charles Smallwood, Dr. W. S. Galler, Dr. E. W. Hauck, Dr. F. W. Getzen, Dr. T. H. Pierce

NAME AND ADDRESS OF APPLICANT INSTITUTION

Department of Chemical Engineering
North Carolina State University
Raleigh, North Carolina 27607

[illegible]

The Environmental Protection Agency has recognized the fact that there is, at present, inadequate knowledge of the environmental effects associated with the commercial development of coal gasification. While this problem is being attacked in many ways, there is a definite need for an experimental facility devoted entirely to the identification of potentially harmful effluents from coal conversion processes.

This project is for operation, testing and evaluation of a small pilot plant coal gasifier - gas cleaning facility to be located at North Carolina State University.

The objective of the project is to determine the performance characteristics and the environmental impact of a typical coal gasification and gas cleanup process. The project will identify and trace all potential air and water pollutants from the process.

[illegible] Engineering	SIGNATURE OF PRINCIPAL INVESTIGATOR J. K. Ferrell	DATE April 16, 1976

[illegible]	[illegible] [illegible]	[illegible] EPA, IERL, Research Triangle Park, N.C.

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	[illegible]
461,849	76		10/1/76	9/30/81

EPA Form 5760-1 [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (Do not use this space) SSIE 76 GDC

TITLE OF PROJECT

Preliminary Environmental Assessment of CAFB Process

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. A. S. Werner   8-223-2100, ask for (617) 275-9000

NAME AND ADDRESS OF APPLICANT INSTITUTION

GCA Corporation
Burlington Road
Bedford, Mass. 01730

SUMMARY OF PROPOSED WORK [illegible]

The technical objective is to provide a preliminary environmental assessment of the CAFB process prior to the initiation of the demonstration.

This is a [illegible] task of 4-months duration, Task 1. Conduct a "Devils Advocate" preliminary environmental assessment of the CAFB process. Task 2. Determine the tests which should be run on the ESSO unit. Task 3. Evaluate the tests made on the ESSO unit. Task 4. Prepare a final report with recommendations to IERL for follow up on (1) ESSO project, (2) demonstration, and (3) environmental assessment.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible] X [illegible]	TASK NO. 9(2-8)/1	PROJECT OFFICER S. L. Rakes RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$38,848	76	0	11-5-75	3-5-76

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NOTICE OF RESEARCH PROJECT

PROJECT NO. [illegible]

SSIE

7W 0302

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT **Development of CAFB Atmospheric Gasifier for Generation of Clean Fuel Gas from Residual Oil**

GIVE NAMES, DEPARTMENTS AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Graham L. Johnes   Telephone: Abingdon 1[illegible], England
Place call to London through overseas operator

NAME AND ADDRESS OF APPLICANT INSTITUTION

ESSO Research Centre
Abingdon, Oxfordshire
England   OX13 6AE

SUMMARY OF PROPOSED WORK [illegible]

The technical objective is to provide design information and to support the construction and operation of a demonstration plant.

Task 1 - To evaluate 3 new limestones and a new fuel for CAFB operations. Task 2 - To consolidate understanding of process: (A) Analysis data; (B) Mathematical model; (C) Predict Performance. Task 3 - To test design features of proposed demonstration plant. Task 4 - To evaluate one or more of: (1) Procedure change/mod made based on Task 3; (2) An additional limestone; (3) Heavier fuel-vacuum bottoms; (4) Other design features; (5) Test program for demo plant. Task 5 - To provide advice, consultation and technical expertise to support demonstration plant. Task 6 - To determine effect of CAFB process on potentially harmful elements other than SO_2 and NO_x.

IDENTIFY [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible] X	TASK NO. 9(C)-81/4	PROJECT OFFICER S. L. Rakes RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED $678,200	F.Y. 76	[illegible] 2	STARTING DATE 5-6-76	ESTIMATED COMPLETION DATE FY-1981

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U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved [illegible] PROJECT NO. [illegible] 76 ODO

TITLE OF SUBJECT

Engineering Support of the CAFB Demonstration Plant Program

SCIENTIFIC PERSONNEL [illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Project Manager - Dr. D. L. Keairns, Mgr., Fluidized Bed Engineering Research

NAME AND ADDRESS OF APPLICANT INSTITUTION

Westinghouse Research Laboratories
Beulah Road
Pittsburgh, Pa. 15235 (412) 256-7340

SUMMARY OF PROPOSED WORK [illegible]

The contractor will perform experimental and engineering studies to support the CAFB demonstration plant program, to develop the fluidized bed gasification process, and to provide program assistance to EPA. The tasks include work on the high temperature sulfur removal system, including sorbent selection, spent sorbent processing, spent sorbent utilization, and spent sorbent disposal; alternate concepts, including sorbents, fuels, applications, and process design; control technology; environmental impact; and systems evaluation. The program will extend previous work carried out by Westinghouse in all of the areas identified. The program will develop design and operating data, identify test programs, test alternative system components, provide technical support, and provide evaluation of test data.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	[illegible] 68-02/4	PROJECT OFFICER Mr. S. L. Rakes IERL-RTP

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$150,862	76	2	5-11-76	Oct 1981

EPA Form [illegible] [illegible]

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NOTICE OF RESEARCH PROJECT

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PROJECT NO. (Do not use this space)

SSIE 78 C[illegible]

TITLE OF PROJECT

Inc special Funding - Development of the CAFB Process

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Graham L. Johnes Telephone: Abingdon 1000, England
Place call to London through overseas operator.

NAME AND ADDRESS OF APPLICANT INSTITUTION

ESSO Research Centre
Abingdon, Oxfordshire
England OX13 6AE

SUMMARY OF PROPOSED WORK – [illegible]

The technical objective is to provide assessment of the CAFB process as a clean fuels producer for a wide range of fuels and uses.

Task 1 - Related work: To provide EPA with information on the potential for employing the CAFB process with a wider range of fuels, including solids fuels. Task 2 - Tests of a fuel gas cleanup: To evaluate the use of the ESSO continuous CAFB unit as a source of low Btu gas so that cleanup schemes may be tested. Task 3 - Assessment of pressurized CAFB (PCAFB): To assess the technical and economic viability of the PCAFB, including feedstock supply.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD	TASK NO.	PROJECT OFFICER
X [illegible]	9(G-0)/4	S. L. Rakes
		RESPONSIBLE EPA ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
600,000	78	3	4-21-76	FY-1981

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PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

78 [illegible]

TITLE OF PROJECT

CAFB Demonstration

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. Frank Zoldak	8-341-3000 ask for (201)-533-3648
Mr. Bruce Halliday	8-341-3000 ask for (201)-533-2846
Mr. Ernest Damon	

NAME AND ADDRESS OF APPLICANT INSTITUTION

Foster Wheeler Energy Corporation
12 Peach Tree Hill Road
Livingston, N. J. 07039

SUMMARY OF PROPOSED WORK - [illegible]

The technical objective is to demonstrate, on a commercial scale (about 20 MW), the CAFB process and to perform environmental assessment of the process.

Task I - Design preparation and review: Design, development, fuel selection, definitive design process design manual. Task II - Construction Planning: Site planning and approval, construction and fabrication drawings, construction progress. Task III - Experimental test program: Operating variables primary fuel, performance parameters, operating variables secondary fuels, operating variables solids fuels. Task IV - Performance and emission testing: Records, baseline correlations, spent material studies. Task V - System evaluation: Process design manual update. Task VI - Reports of work: Conceptual design commercial systems (about 250 MW). Milestones: 1. work 2. definitive design 3. prelim. design manual 4. begin construction 5. start up 6. start test program.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR AGENCY USE ONLY

SUPPORT METHOD [illegible] X [illegible]	ROAP NO. 01Q-01/4	PROJECT OFFICER S. L. Rakes RESPONSIBLE ORGANIZATION IERL-RTP		
FUNDS OBLIGATED $1,255,000	F.Y. 78	[illegible] 3	STARTING DATE 6-2-76	ESTIMATED COMPLETION DATE FY-1981

EPA Form 5700-1 (7-73) REPLACES PHS FORM 166 AND [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
[illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

78 CDO

TITLE OF PROJECT

Environmental Assessment/Systems Analysis of Residual Oil

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

D. E. Jones, Chief Process Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Catalytic, Inc.
Post Office Box 18232 - Highway 51 & Johnston Road
Charlotte, N. C. 28210
(704)-542-4720

SUMMARY OF PROPOSED WORK [illegible]

Catalytic, Inc. will make an assessment of all residual fuel oil desulfurization processes in order to determine the costs and efficiencies for reduction of pollution.

The study will start with a literature search or all commercial processes now in operation and those which may be placed in operation during the next three years.

The commercial processes to be studied are partial oxydation, hydrodesulfurization and flue gas scrubbing. Demonstration plants will then be studied including the chemically active fluid bed process (CAFB).

The study will inclued only production of fuel for boilers, pipe line gas and combined cycle turbines.

A review and analysis of all environmental data, including health aspects will be made for each process. This will be followed by plant testing. The analysis will include sulfur compounds, NO_x, particulates, trace elements, CO, hydrocarbons and carcogenic compounds.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

TASK NO. [illegible]-101/5

PROJECT OFFICER [illegible]

RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED $170,000

F.Y. 76

[illegible] 3

STARTING DATE 6-11-76

ESTIMATED COMPLETION DATE FY-1980

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

DATE
78 [illegible]

TITLE OF PROJECT
Catalytic Desulfurization and Denitrogenation

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Charles N. Satterfield, Professor of Chemical Engineering
Michael Modell, Associate Professor of Chemical Engineering
John Wilkens, Research Assistant, Sc.D. candidate.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

SUMMARY OF PROPOSED WORK [illegible]

Catalytic hydrodesulfurization (HDS) and hydrodenitrogenation (HDN) reactions for the removal of organic sulfur and nitrogen compounds from liquid fuels are becoming increasingly important as strict sulfur and nitrogen oxide emission standards are set, and "dirtier" oils derived from shale and coal attain wider use.

A quantitative description of the interferences between these two reactions, which have only recently begun to be studied, is necessary for optimal design of commercial processing units. To date, we have studied thiophene and pyridine as representative sulfur and nitrogen compounds in a continuous-flow microreactor to model basic interactions. Pyridine inhibits thiophene HDS under all experimental conditions used. Sulfur compounds exhibit a dual effect on the HDN of pyridine; a reaction rate inhibition gives way to an enhancement at more severe reaction conditions. Theoretical considerations have been presented to account for each of these effects. Reactions of more complex compounds and their interactive reaction kinetics are currently under investigation.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	[illegible]	PROJECT OFFICER
[illegible]	1142-111/3	William J. Rhodes RESPONSIBLE ORGANIZATION IERL-RTP

[illegible]	FY	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$91,874	76	ORD	6/75	6/78

EPA Form 1760-1 (7-73) REPLACES [illegible] FORM [illegible] WHICH MAY NOT BE USED

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Form Approved
OMB No. 158-R0094

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

GDO

TITLE OF PROJECT

Program Support in Fossil Fuel Processing and Synthetic Fuels

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

T. Borer - Technical Manager/Coordinator

NAME AND ADDRESS OF APPLICANT INSTITUTION

Cameron Engineers, Inc.
1315 S. Clarkson Street
Denver, Colorado 80210

SUMMARY OF PROPOSED WORK – [illegible]

Cameron Engineers will provide to EPA systems analysis and program support primarily in the areas of coal processing, coal liquefaction, coal gasification, and shale oil processing. Included in these areas are the environmental assessment of both the technologies and utilization of products and by-products as well as the environmental assessment of environmental control technology development for these technologies and utilization of their products and by-products.

Cameron Engineers' is to provide a viewpoint independent from that of EPA contractors that are working in the environmental assessment, environmental control technology development, and process technology development areas. Cameron Engineers' primary role is to provide technical information to the EPA technical project management team in its decision making role.

This will be accomplished through background functions (such as literature surveys and reviews of technical reports), coordination functions, communication functions and program planning support. This technical assistance will be provided on an as requested basis by Task Order.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE June 7, 1976

FOR EPA OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ GRANT ☐ COOPERATIVE AGREEMENT ☒ CONTRACT ☐ INTERAGENCY AGREEMENT	TASK NO. 10	PROJECT OFFICER RESPONSIBLE ORGANIZATION [illegible]

FUNDS OBLIGATED $20,000	F.Y.	NO. OF PROFESSIONAL PERSON-YEARS [illegible]	STARTING DATE 06/01/76	ESTIMATED COMPLETION DATE 05/31/77

EPA Form 5760-1 (7-72) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. (Do not use this space)

CDC

TITLE OF PROJECT

Program Support in Environmental Assessment and Control Technology Development for [illegible]

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Stephen L. Brown, Manager, Environmental Analysis Program, Operations Evaluation Department

Mr. Charles W. Hulburt, Senior Operations Analyst, Operations Evaluation Department

Mr. Ronald L. Dickenson, Manager, Synthetic Fuels, Center for Energy Economics

NAME AND ADDRESS OF APPLICANT INSTITUTION

Stanford Research Institute
333 Ravenswood Avenue
Menlo Park, California 94025

SUMMARY OF PROPOSED WORK [illegible]

The overall objective of this project is to provide technical and administrative support to the EPA Office of Energy, Minerals and Industry in carrying out its responsibilities as lead agency for environmental research on energy processes. In particular, support is being given in the areas of environmental assessment and control technology development for advanced fossil fuels conversion techniques, including high and low BTU coal gasification, coal liquefaction, residual oil gasification, oil shale retorting and certain problems of oil refining. Specific objectives include maintaining and updating a document on environmental problems and research and development programs, producing and maintaining a system for describing R&D options and setting priorities among the options, providing administrative and technical support for the Interagency Advanced Fossil Fuels Sector Group, and various short term assignments, such as professional meeting reporting, review of research plans, and consultation on specific technical problems.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 4/06/76

EPA USE ONLY

[illegible]	TASK NO. 10	PROJECT OFFICER	
		ORD-OEMI	
FUNDS OBLIGATED	[illegible]	STARTING DATE 1976	ESTIMATED COMPLETION DATE

EPA Form 5700-1 (7-72) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

78 [illegible]

TITLE OF PROJECT

Environmental Assessment of Existing Coal Gasification Plant

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

The objective is to obtain data on an existing coal gasification complex and to analyze its significance to the environment. The approach will be to gather existing data together, much of which is unpublished, on the quantities and compositions of effluent streams and to correlate and explain the data and its variations. The information will be multimedia and will include descriptions of the process, flow diagrams, heat balances, and material balances on important constituents.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X	FILE NO. [illegible]	PROJECT OFFICER William J. Rhodes [illegible] IERL-RTP

[illegible]	F.Y. 78	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

EPA Form 5700-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT: Environmental Aspects of Retrofitting Selected Industries to Low and Intermediate Energy Gas from Coal

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

EPA Project Monitor : W. J. Rhodes
Battelle Project Director : R. E. Barrett
Principal Investigator : D. A. Ball

NAME AND ADDRESS OF APPLICANT INSTITUTION:
Battelle Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

(1) The objective of this study is to evaluate the environmental impact and effect on industrial processes when a low or intermediate energy gas from coal is used as an on-site generated industrial fuel.

(2) Two industries that have high potential for successful retrofitting to utilize low energy fuel gas as a replacement energy source for gas and fuel oil will be selected. An analysis will be made of various combinations of promising industrial application/coal gasifier combinations. The analysis will include detailed material and energy balances, economic as[illegible]s, and preparation of preliminary overall designs of the industrial plan[illegible] [illegible] conversion to using coal gasification.

(3) Current activities include the selection of the target industries and the coal gasification and gas cleanup systems to be considered. Analysis of selected industry-gasifier combinations will begin about January 1, 1975.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

[illegible]	ROAP NO.	PROJECT OFFICER
[illegible]	68-02-101/8	William J. Rhodes ORGANIZATIONAL LOCATION IERL-RTP

FUNDS (ESTIMATED)	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$8,000	76	[illegible]	6/74	4/76

EPA Form [illegible] REPLACES [illegible] FORM [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

SSIE

78 [illegible]

TITLE OF PROJECT

Pollutants from Synthetic Fuel Production

NAMES, DEPARTMENT, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK – [illegible]

The objective of the research is to develop a fundamental understanding of factors and conditions which cause the production of environmental pollutants in synthetic fuels processes. The approach is to design, fabricate, and operate a laboratory scale reactor to simulate conditions of synthetic fuel reactors. The work will include studying the effect on pollutant formation of different input coals and reactor parameters, and determining the kinetics of pollutant formation in order to provide data for environmental assessment and development of control technology.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (If any)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

EPA OFFICE USE ONLY

SUPPORT METHOD (Check one) [illegible] [illegible] [illegible] A [illegible]	TASK NO. 1SIQ-161/5	PROJECT OFFICER William J. Rhodes RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y. 78	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

EPA Form 5700-1 (1-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved OMB No. [illegible] PROJECT NO. (DO NOT USE THIS SPACE) SSIE [illegible]

TITLE OF PROJECT

Environmental Assessment of High Btu Gasification

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK - [illegible]

The overall technical objective of this program is the performance of a comprehensive multimedia environmental assessment of the technologies for converting coal into high Btu products. The approach is to conduct environmental assessment activities which consist of technology overview, preliminary impact assessment, input material characterization, process engineering studies, control technology evaluations and revised impacts and to conduct data acquisition which includes site location, tests programs development, testing, and reporting.

[illegible] PROFESSIONAL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR		DATE
FOR OFFICE USE ONLY			
[illegible] [illegible] X [illegible] [illegible]	TASK NO. [illegible]-101/[illegible]	PROJECT OFFICER William J. Rhodes RESPONSIBLE [illegible] OFFICE [illegible]-RTP	
FUNDS OBLIGATED | F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE 9/[illegible]

EPA Form 5700-1 ([illegible]) REPLACES [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT

Environmental Assessment of Effluents from Coal Liquefaction

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATOR OR PROJECT DIRECTOR AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dwight B. Emerson, Department of Environmental Engineering, Manager
V. Bruce May, Department of Environmental Engineering, Chemical Engineer
J. Carl Uhrmacher, Department of Environmental Engineering, Chemical Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION
Hittman Associates, Inc.
9190 Red Branch Road
Columbia, Maryland 21045

SUMMARY OF PROPOSED WORK [illegible]

The overall technical objective of this program is the performance of a comprehensive multimedia environmental assessment of the technologies for converting coal into liquid fuels and of the utilization of these liquid fuels in stationary source applications. Technologies for conversion of coal to liquid fuels will be considered to encompass all methods of coal treatment in which the majority of the coal-like structure of the raw feed material is transformed to a liquid form, either at the treatment conditions of the process or at ambient conditions. Technologies which involve the production of liquid fuels from coal through the initial use of commercial gasification techniques will also be considered. The approach to meeting this technical objective will be a ten-phase study program composed of: Technical and Environmental Overviews; Technology Characterizations; Effluent Problem Definition; Identification of Technology and Information Requirements; Environmental Test Program; Data Acquisition; Environmental Assessments; Effluent Control Technology Evaluations; Reassessments and Recommendations; and Environmental Assessment Program Support.

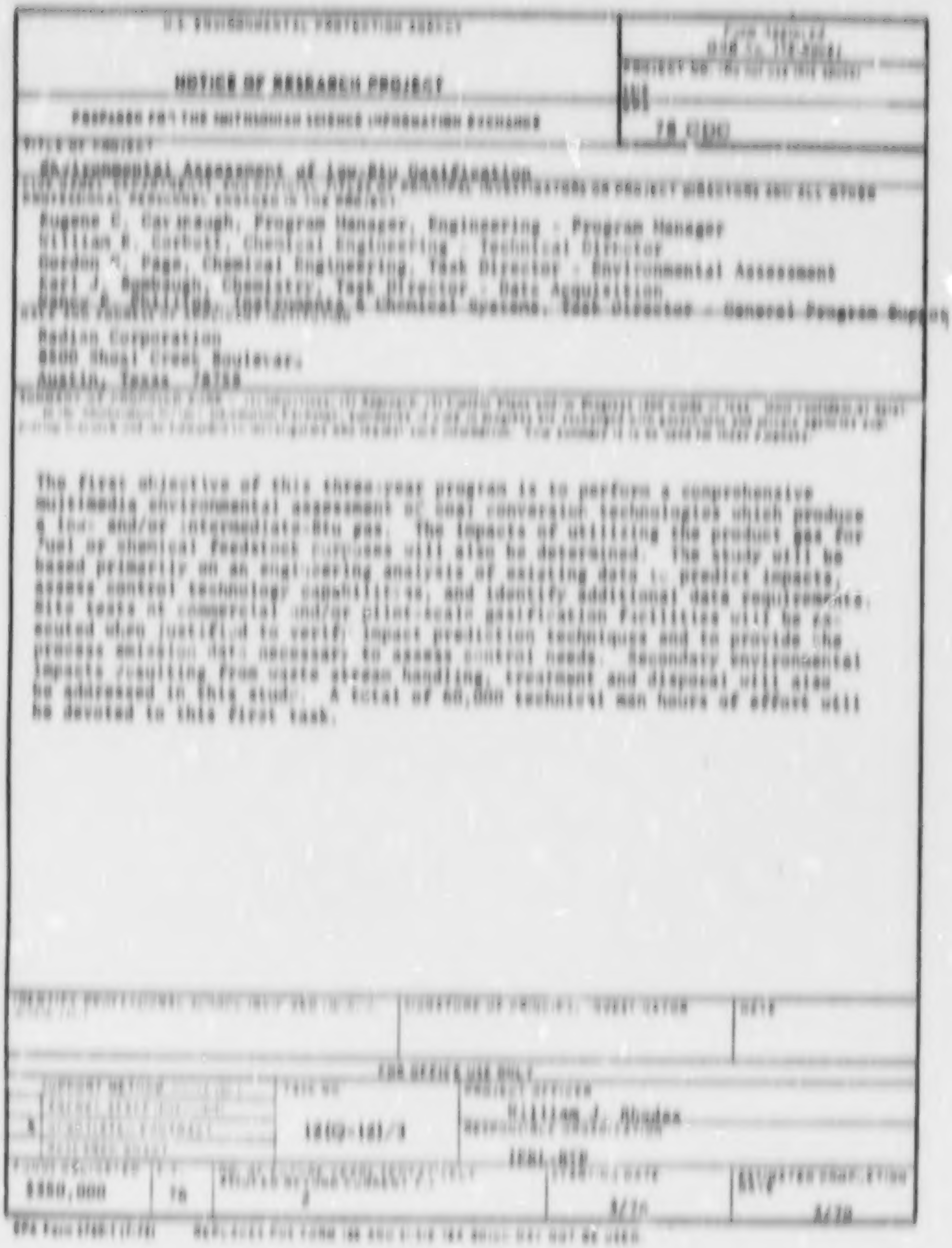
IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	FILE NO.	PROJECT OFFICER
X [illegible]	[illegible]	W. J. Rhodes
		RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$400,000	76	[illegible]	July 12, 1976	July 11, 1979

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED



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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE

76 [illegible]

TITLE OF PROJECT

Environmental Assessment of Low-Btu Gasification

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Eugene C. Cavanaugh, Program Manager, Engineering - Program Manager
William E. Corbett, Chemical Engineering - Technical Director
Gordon C. Page, Chemical Engineering, Task Director - Environmental Assessment
Karl J. Bombaugh, Chemistry, Task Director - Data Acquisition
[illegible] Phillips, Instruments & Chemical Systems, Task Director - General Program Support

NAME AND ADDRESS OF APPLICANT INSTITUTION

Radian Corporation
8500 Shoal Creek Boulevard
Austin, Texas 78758

SUMMARY OF PROPOSED WORK [illegible]

The first objective of this three-year program is to perform a comprehensive multimedia environmental assessment of coal conversion technologies which produce a low- and/or intermediate-Btu gas. The impacts of utilizing the product gas for fuel or chemical feedstock purposes will also be determined. The study will be based primarily on an engineering analysis of existing data to predict impacts, assess control technology capabilities, and identify additional data requirements. Site tests at commercial and/or pilot-scale gasification facilities will be executed when justified to verify impact prediction techniques and to provide the process emission data necessary to assess control needs. Secondary environmental impacts resulting from waste stream handling, treatment and disposal will also be addressed in this study. A total of 60,000 technical man hours of effort will be devoted to this first task.

IDENTIFY PROFESSIONAL SCHOOL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X	TASK NO. 1B12-121/3	PROJECT OFFICER William J. Rhodes RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$350,000	76	3	6/76	3/79

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

[illegible]

78 (IX)

TITLE OF PROJECT

Control Technology Development for Fuel Converter Outputs

[illegible]

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

[illegible]

The objective of this program is to develop, evaluate and demonstrate environmentally sound control technology for fuel converter output streams, fuel treatment and processing. The approach is to assess available and developing control technology, to develop control technology through theoretical research, laboratories and bench scale development and to evaluate promising control technology alternatives by overall comparative analysis and design preparation.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO.	PROJECT OFFICER
2	14(J)-141	Hugh J. [illegible] RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
	76			

EPA Form [illegible] REPLACES [illegible]

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. (Do not use this space)

SSIE

78 [illegible]

TITLE OF PROJECT: Assessment and Control of Wastewater Contaminants Originating from the Production of Synthetic Fuels from Coal

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

NA transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this project is to assess the environmental impact of wastewater contaminants originating from the production of synthetic fuels from coal, and to evaluate alternative wastewater treatment technologies for the control of these contaminants. The project is carried out in several phases over a 5-year period consisting of (a) a literature review and survey of pilot- and full-scale coal conversion facilities to identify specific contaminants which might be found in coal processing wastewaters, (b) a study of the biodegradability of selected organic constituents from such wastewaters including an assessment of the aquatic impact of these constituents and biodegradation products, (c) biological and physical-chemical treatability studies of a selected organic constituents and identification of the residuals following treatment, (d) animal toxicology studies to evaluate the potential health effects of those wastewater components for which sufficient information is not available in the literature, (e) treatability studies of composite synthetic and real coal-processing waters including analytical characterization and aquatic impact assessment of the treated waters, and (f) development of design criteria for continuous treatment of wastewaters from coal-conversion facilities.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

[illegible]	TASK [illegible] 14 [illegible]	PROJECT OFFICER Mark J. Stutsman RESPONSIBLE ORGANIZATION IERL-RTP

FUNDS OBLIGATED	F.Y. 76	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

[illegible]

78 [illegible]

TITLE OF PROJECT
Control Technology Development for Wastes/Wastewater

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA - transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected

SUMMARY OF WORK [illegible]

The objective of the program is to identify and develop needed control technology for the treatment of solid and liquid wastes from fuel conversion processes and the preparation, storage and feeding of coal to converter systems. The program will provide to the coal conversion industry a basis for design, operating characteristics, cost estimation and comparative analysis for control systems. The approach is to assess available and developing control technology, to develop control technology through theoretical research, laboratory and bench scale development and to evaluate promising control technology alternatives by overall comparative analysis and design preparation.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED, IF ANY

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]

TASK NO.
1A(?)-14(?)

PROJECT OFFICER
[illegible]

RESPONSIBLE ORGANIZATION
IERL-RTP

FUNDS OBLIGATED

F.Y.
76

[illegible]

STARTING DATE

ESTIMATED COMPLETION DATE

EPA Form [illegible] REPLACES [illegible] FORM [illegible] WHICH MAY NOT BE USED

F. NUCLEAR

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OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

SSIE

EPA [illegible]

TITLE OF PROJECT

Implementation of a Technology Assessment Methodology for Radioactive Waste Management

NAMES, DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Stanley Logan, Associate Professor
Department of Chemical and Nuclear Eng.

NAME AND ADDRESS OF APPLICANT INSTITUTION

The University of New Mexico
Albuquerque, New Mexico

SUMMARY OF PROPOSED WORK [illegible]

EPA currently is working with the University of New Mexico to develop a comprehensive model for the public health and environmental impacts from the high-level and transuranic contaminated wastes in geological formations. The model will permit parametric studies to be performed for various geological disposal media and for wastes in different forms, such as glass or ceramic. The output will include potential environmental impacts associated with the possible release of radioactivity. The model will be designed to incorporate the latest available data to permit rapid assessment of the cost-effectiveness of various combinations of waste content, waste preparation, packaging, and geological emplacement methods, and will expedite EPA reviews of Environmental Impact Statements. This information is scheduled to be available in DRAFT form during FY 77.

The outputs of this model will also be used to help quantify environmental criteria and to supply information for developing high level standards for terminal disposal. They also may be used to determine monitoring requirements and radioactivity levels for initiation of emergency response protective actions. Any such standards would not be for specific facilities or sites, but would provide EPA with broad numerical guides for use in establishing licensing and regulatory controls. This information is scheduled to be made available for use during FY 78.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE Oct 12 1976

EPA OFFICE USE ONLY

SUPPORT METHOD [illegible] [illegible]	FISCAL [illegible] 3	PROJECT OFFICER Stanley M. Goldberg ORP-Technology Assessment Division, AW-459

[illegible]	F.Y.	[illegible]	STARTING DATE	DATE [illegible]
20	1976	0	August 1, 1976	June 30, 1978

EPA Form [illegible]

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U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

TITLE OF PROJECT: Evaluation of Problems and Limitations of Ocean Disposal as a Radioactive Waste Management Alternative

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Robert S. Dyer, Project Director
Office of Radiation Programs (AW-460)
Environmental Protection Agency
Washington, D.C. 20460 (Phone: 755-4861)

Marilyn Varela, Assistant
Office of Radiation Programs

NAME AND ADDRESS OF SUPPORTING INSTITUTION

U.S. Environmental Protection Agency
401 M Street, S.W., Washington, D.C. 20460

SUMMARY OF PROPOSED WORK [illegible]

Objectives

Pursuant to the legislative mandate of the Marine Protection, Research, and Sanctuaries Act of 1972 (PL 92-532) EPA was given specific regulatory requirements to control the ocean disposal of radioactive wastes. To implement these requirements, EPA Office of Radiation Programs initiated a site specific survey program in 1974 to investigate two disused deepsea radioactive waste dumpsites. The overall objective was to determine the fate of the containerized radioactive wastes dumped by the United States between 1946 and 1962, and to relate these findings to the EPA permit program and the development of improved packaging, site selection, and monitoring requirements.

Current Progress

Low levels of environmental plutonium contamination have been found in the sediments at the Pacific-Farallon Islands disposal site in depths of 900 meters and 1700 meters. Cesium-137 has been detected in sediments at the Atlantic disposal site at a depth of 2800 meters. FY 1976 investigations focused on the use of the deep-submersible ALVIN to survey the Atlantic 2800m site in more detail. The following major goals were achieved: (1) an 80-gallon radioactive waste drum was recovered from a depth of 2800m for metal corrosion rate and matrix degradation rate determinations to estimate how long an unimploded drum would remain intact, (2) vector-averaging current meters were deployed to estimate potential radionuclide dispersion rates near the ocean bottom, (3) precise sediment cores and grabs were taken to look at: (a) the extent and direction of radionuclide contamination, and (b) the geochemical retention characteristics for released radionuclides. Post-operations analyses are underway.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF ANY) **Not Applicable**	SIGNATURE OF PRINCIPAL INVESTIGATOR Robert S. Dyer Robert S. Dyer	DATE October 15, 1976

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SUPPORTING AGENCY [illegible] 105	Task No. 6	PROJECT OFFICER Robert S. Dyer	SUPPORTING ORGANIZATION U.S. Environmental Protection Agency	
Funds Estimate* $65,000	F.Y. 76	[illegible]	STARTING DATE April 1976	ESTIMATED COMPLETION July 1977

*Funds approximate not for citation. [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

Operate OHMSETT

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Robert Ackerman, Manager
Edward [illegible], Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION
Mason & Hanger - Silas Mason Co., Inc.
P. O. Box 156
Leonardo, New Jersey 07737

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to provide an operations and maintenance staff and a mechanism for operating the OHMSETT facility.

The contractor provides a permanent staff of a manager, a secretary, an engineer, a chemist, an accountant/expediter and five technicians. Authority is provided in the contract for the local hiring of temporary personnel and the execution of small subcontracts as needed to operate and maintain the facility.

Funding for this "Operate OHMSETT" project is provided by various testing programs executed for OHMSETT "customers". Each testing program is designated Job Order 1, 2 etc., and is performed on a time-and-materials basis.

Facility customers are at present limited to Federal, state and local government agencies. Primary customers are the U.S. Coast Guard, the U.S. Navy, U.S. EPA oil spill related projects, and U.S. EPA hazardous material spill related projects. Each customer-related job order constitutes an EPA project funded by EPA or an IAG with another agency. In each case, a customer-related job order represents incremental funding to the "Operate OHMSETT" project. In some cases, the job orders themselves are incrementally funded, since it is not always possible to accurately estimate the actual cost to complete a job order prior to its execution. The project provides other Federal agencies with a facility to accomplish their similar projects, at no expense to EPA

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/6/78

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] ☒ [illegible]	[illegible]	PROJECT OFFICER John S. Farlow [illegible] IERL-Ci, Edison

FUNDS OBLIGATED $871,000	FY 78	NO. OF PROFESSIONAL STAFF YEARS [illegible] 4	STARTING DATE 9/76	ESTIMATED COMPLETION DATE 9/80

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0082

PROJECT NO. (Do not use this space)

SSIE

CIEF

TITLE OF PROJECT Improving Model for Simulating Groundwater Transport of Radioactive Pollutants from Buried Low-Level Radioactive Wastes

Dr. James F. Davis, State Geologist 518-474-5816
New York Geological Survey
State Museum and Science Service
New York State Education Department
Albany, New York 12224

NAME AND ADDRESS OF APPLICANT INSTITUTION
New York Geological Survey
State Museum and Science Service
New York State Education Department, Albany, New York 12224

SUMMARY OF PROPOSED WORK

(1) Objective Summary: Directed primarily at control of solid low-level radioactive wastes resulting from power production by nuclear reactors. Two major objectives include: (1) determining retention of radioactive and stable nuclides by fracture and rocks (Phase I) and (2) improving models simulating groundwater transport of radioactive pollutants after burial (Phase II).

(2) Approach: Feasibility of developing a generic method for making field determinations of retention of radioactive and stable nuclides by fractured soil and rock (Phase I) will be evaluated using FY 75 funds. Field sampling stations have been installed and some samples have been collected and analyzed. However, evaluation of the feasibility is still in progress. Presuming it is feasible, major tasks under portion of project will be (1) to determine degree of retention actually occurring field conditions and (2) to develop a method for estimating attenuation which may be expected by fractured rock and soils.

Feasibility of developing generic method for analyzing water pathways for land burial site, including developing transfer coefficient, and estimating impact on environment of burial site and potential dose to man (Phase II) will be partially evaluated with FY 75 funds. Field sampling stations have been installed and some samples have been collected and analyzed. Major tasks under this portion of project include: (1) completing determination of feasibility of analyzing water pathways, etc., discussed above and presuming these determination are feasible, (2) performing pathways analysis-dose assessment of an operating burial site under field conditions, and (3) estimating what safe limits of discharge of radioactivity from site are current plans/progress contract let in late June.

IDENTIFY PROFESSIONAL SCHOOL	SIGNATURE OF PRINCIPAL INVESTIGATOR James F. Davis	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO. 1	G. Lewis Meyer RESPONSIBLE ORGANIZATION Office of Radiation Programs

FUNDS ALLOCATED	FY		STARTING DATE	ESTIMATED COMPLETION DATE
$125,000	75	4 years	July 1975	June 1979

EPA Form 5760-1

G. THERMAL

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U.S. GOVERNMENT PRINTING OFFICE [illegible]

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OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

FR [illegible]

TITLE OF PROJECT

Water Recycle/Reuse Alternatives in Coal-Fired Steam-Electric Power Plants

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Frank G. Lesich-Program Manager
James G. Noblett, Jr.-Project Director and Task Leader, Water Reuse Strategies
R. Pyle-Task Leader, Chemistry
Wilbert H. Oshners, Jr.-In-House Consultant

NAME AND ADDRESS OF APPLICANT INSTITUTION

Radian Corporation, P.O. Box 9948
8500 Shoal Creek Blvd.
Austin, Texas 78766

SUMMARY OF PROPOSED WORK [illegible]

(1) Objectives: To choose five regionally representative power plants and determine the most technically and economically feasible water recycle/reuse and treatment options for each plant.

(2) Approach: Computer models will be developed and used to simulate the water systems of each of the typical plants selected for study. Curves or nomographs will be prepared to show parameter sensitivity of the water system operations.
After five plants have been studied, one will be chosen for a demonstration program. A test plan for this program will be written, and the costs of implementing the program will be defined.

(3) Progress: Three plants have been studied and a draft technical note written for each plant. Two more plants are currently being selected for study.

IDENTIFY CLASSIFIED RESEARCH [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

SSIE OFFICE USE ONLY

[illegible]	TASK NO. S1P-11/6	PROJECT OFFICER Fredrick A. [illegible] IERL/RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
157,822	76	0	6/30/75	7/30/77

EPA Form 5760-1 (7-72) PREVIOUS EDITION [illegible] MAY NOT BE USED

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PROJECT NO. (DO NOT USE THIS SPACE)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

78 ODD

TITLE OF PROJECT

Optimizing Design Specifications for Large Dry Cooling Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Principal Investigator: Tovi Rozenman, PFR Engineering Systems Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION

PFR Engineering Systems, Inc.
4676 Admiralty Way, Suite 832
Marina Del Rey, CA 90291

SUMMARY OF PROPOSED WORK [illegible]

Objectives: Develop techniques for optimizing the design of power plant dry cooling system.

Approach: Contractor will survey relevant literature and collect data pertinent to dry cooling towers. An optimization model will be developed which treats the following continuous variable: module width and length, number of modules, fan horsepower, and water flow rate. Parametric studies and sensitivity analyses will be conducted to determine the effect of each variable on design and cost.

Plans/Progress: Project is nearing competion. The original scope has been modified to include surface condensers. That portion is in progress.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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SUPPORT METHOD

X

11(P-13)/1

PROJECT OFFICER
James P. Chasse

RESPONSIBLE ORGANIZATION
IERL/RTP

$40,17

78

STARTING DATE
6/10/76

ESTIMATED COMPLETION DATE
12/10/78

EPA Form 5760-1 (2-73) REPLACES PHS FORM WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

SSIE

FB [illegible]

TITLE OF PROJECT: Wastewater Renovation-Recycle for a Novel Power Plant Cooling Cycle Utilizing Irrigation Drainage with Interface-Enhanced Evaporation.

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Hugo H. Sephton-Principal Investigator-Richmond Field Station

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Regents of the University of California
c/o Campus Research Office; M-11 Wheeler Hall
University of California; Berkeley, CA 94720

SUMMARY OF PROPOSED WORK [illegible]

(1) Objectives: To determine the feasibility and economics of recovering sodium sulfate from the concentrated waste brine from treated irrigation return flow water used for cooling tower make-up. After its removal (Na_2SO_4) the remaining brine will be evaluated for the regeneration of the ion-exchange softening resins used to treat the irrigation return waters. The feasibility and economics of recovering calcium sulfate obtained during regeneration of the ion-exchange softeners will be determined. The economics of various environmentally acceptable methods of disposing the final remaining concentrated soluble brine waste will be determined.

(2) Approach: A vertical tube crystallizing evaporator will be used to further concentrate the blowdown from a cooling tower using ion-exchange softened make-up water from irrigation return flows. Sodium sulfate will be recovered from the concentrate containing precipitated (Na_2SO_4) by filtration. The filtrate will be used to regenerate the ion-exchange softeners with NaCl added if appropriate. During the regeneration calcium sulfate will be liberated and precipitated for recovery.

(3) Progress: It is expected that this grant will be awarded soon.

IDENTIFY ADDITIONAL SCIENTISTS [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible] [illegible] [illegible] X [illegible] GRANT	TASK NO. 11IP-131/4	PROJECT OFFICER Fred Roberts RESPONSIBLE ORGANIZATION IERL/RTP

[illegible] 0	F.Y. 76	[illegible] 0	STARTING DATE Approx. 10/1/76	ESTIMATED COMPLETION DATE 12 mos. from start

EPA Form 5760-1 (7-72) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
	PROJECT NO. [illegible]
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	[illegible]

TITLE OF PROJECT

Power plant cooling tower blowdown recycle-Mobile pilot plant const. and field test.

[illegible]

Dr. Hugo H. Sephton-Sea Water Conversion Laboratory-Research Chemist College of Engineering.

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Regents of the University of California
Campus Research Office, University of California, M-11, Wheeler Hall
Berkeley, California 94720

SUMMARY OF PROPOSED WORK [illegible]

(1) Objectives: Design and construct a pilot plant facility combining, in a mobile unit, all the process equipment required to reduce 25,000 gallons per day of cooling tower blowdown to solid residues or slurried solids and distilled water for recycle.

(2) Approach: The facility will include a vertical tube evaporator (VTE) of advanced design, capable of both upflow and downflow modes of operation with (and without) an interface enhancement process which can provide up to a 100% increase in overall heat transfer coefficient (and rates of evaporation) for saline waters under typical VTE process conditions.

The facility will be operated at several existing power-plant sites, on actual cooling tower blowdown to determine best operating conditions, and to demonstrate the feasibility and economics of the system.

(3) Progress: A bidder has been selected for providing a 600HP oil fired boiler to supply steam to the evaporator. Design of the pilot evaporator is underway and will be followed up with bids for its fabrication.

[illegible] College of Engineering	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD [illegible] A	[illegible] [illegible]	PROJECT OFFICER Fred Roberts RESPONSIBLE ORGANIZATION IERL/RTP

[illegible]	F.Y.	[illegible]	STARTING DATE	[illegible] COMPLETION DATE
$ 331,366	76	0	3/1/76	2/15/78

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT: Bromine Chloride - An Alternative to Chlorine for Fouling Control in Condenser Cooling Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Dr. Leonard H. Bongers, Principal Research Scientist, Environmental Technology Center; Dr. Thomas F. O'Connor, Research Scientist, Environmental Technology Center; Dr. Dennis T. Burton, Aquatic Biologist, The Academy of Natural Sciences of Philadelphia.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Martin Marietta Corp., Martin Marietta Laboratories (Environmental Technology Center), 1450 South Rolling Road, Baltimore, Maryland 21227

SUMMARY OF PROPOSED WORK [illegible]

Chlorine (Cl_2) is widely used as an antifouling agent in once-through/condenser cooling water systems. Since residual chlorine and persistent residual chlorine reaction products in discharged cooling water may be deleterious to aquatic organisms in the receiving water body, alternative antifouling agents are being sought. This study is designed to evaluate bromine chloride (BrCl) as such an alternative. Two properties of BrCl will be examined: decay rate and ability to prevent fouling. BrCl will be judged a viable alternative to chlorine if it economically prevents fouling of condenser surfaces without leaving undesirable levels of residual halogens in discharged cooling water.

The program will be conducted at an 1100-MWe fossil fueled, two-unit generating facility using estuarine water for once-through condenser cooling. One unit will be dosed with chlorine while the other unit will receive BrCl. By measuring residual halogen levels at different points along the cooling systems, we will be able to evaluate the decay rate for each halogen as a function of treatment [illegible] and ambient water quality parameters. Fouling rates will be determined in cooling water before biocide addition and at the beginning and end of each condenser system by shunting a fraction of the cooling water through fouling simulators, using glass slides as fouling substrate. Simulated fouling will be related to condenser performance by monitoring hot well temperatures, turbine back pressures and pressures losses across the condenser systems.

Concurrent studies will be conducted to evaluate residual biotoxicity of the chlorinated and brominated cooling water effluents. These studies are being supported by Great Lakes Chemical Corporation, West Lafayette, Indiana, and Ethyl Corp., Ferndale, Michigan.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
NA	Leonard H. Bongers	6/9/76

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[illegible]	[illegible]	PROJECT OFFICER
[illegible]	[illegible]	Fred A. Roberts IERL/RTP

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
62,001 B	76		5/13/76	12/10/76

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PROJECT NO. [illegible]

[illegible]

78 1,000

TITLE OF PROJECT

Thermal Pollution Control State-of-the-Art Manual

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NA-transaction incomplete

NAME AND ADDRESS OF APPLICANT INSTITUTION

To be selected.

SUMMARY OF PROPOSED WORK [illegible]

Objective: To provide an assessment of the state-of-the-art of power plant cooling system design, operation, and economics.

Approach: Contractor will survey literature on the technology and practices for the control of thermal pollution and the conditioning of cooling waters. A comprehensive report on the design and operation of closed-cycle cooling systems will be prepared. Up-to-date capital and operating costs for different systems and site conditions will be compiled.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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X	[illegible]	FILE NO. IERP-(8)	PROJECT OFFICER James P. Chasse RESPONSIBLE ORGANIZATION IERL/RTP

[illegible]	F.Y. 78	[illegible] N	STARTING DATE	ESTIMATED COMPLETION DATE

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U.S. GOVERNMENT PRINTING OFFICE [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT** PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Form Approved [illegible] [illegible] 78 CODE

[illegible]
Advanced Waste Heat Control-Waste Heat and Water Utilizati[illegible]

[illegible]

Robert W. Thomas-Technical Monitor

R. Barry King-Job Leader

[illegible]
Lockheed Electronics Company, Inc.
16811 El Camino Real
Houston, Texas 77058

[illegible]

(1) Objective: Assess the adequacy of available technology for monitoring hazardous chemicals in cooling system effluents.

(2) Approach: Identify hazardous materials in cooling system effluents and evaluate the state-of-the-art for monitoring the identified chemicals. Data derived relative to the adequacy of technology and the critical concentration levels of hazardous chemicals will be used in the development of control strategy and design of control systems.

(3) Progress: A draft report has been completed which identifies hazardous chemicals found in cooling system effluents and prioritizes their environmental impact.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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X [illegible]	FILE NO. 10(P-141/1	PROJECT OFFICER Fred A. Roberts IERL/RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$75,000	76	2	12/1/75	10/30/76

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

76 [illegible]

TITLE OF PROJECT

Vermont Yankee Horticulture Economic and Quality Control Study

[illegible]

Principal Investigator: Edmund F. Gaines, Jr., Assistant to the President

NAME AND ADDRESS OF APPLICANT INSTITUTION

Vermont Yankee Nuclear Power Corporation
77 Grove Street
Rutland, VT 05701

SUMMARY OF PROPOSED WORK [illegible]

Objectives: To evaluate the feasibility of using waste heat from a nuclear power plant for the enhancement of commercial horticulture.

Approach: Investigators will 1) identify the best greenhouse design for the particular situation; 2) determine the effect of state and federal food regulations on the operations; and 3) develop a marketing model for the waste heat facility. Applicant will pursue commercialization if it appears feasible.

Plans: Project was recently initiated.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	[illegible] 1EIP-161/4	PROJECT OFFICER James F. Chasse RESPONSIBLE OFFICE IERL/RTP

[illegible] $20,000	F.Y. 76	[illegible]	STARTING DATE 6/15/76	EXPECTED COMPLETION DATE 11/15/77

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Form Approved [illegible]

PROJECT NO. [illegible]

SSIE

ZR 43211

TITLE OF PROJECT

Beneficial Uses of Warm Water from Condensers of Electric Generating Plants

[illegible]

Principal Investigators: Landis L. Boyd, Assistant Director, Agricultural Experiment Station, University of Minnesota.
Russell Y. Stansfield, Warm Water Administrator, Northern States Power Company.

[illegible]

Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

[illegible]

Objectives: Demonstrate methods for economically and reliably heating, cooling, and managing enclosed growth structures using heated water for energy.

Approach: (1) Construct a 1/2 acre greenhouse with an experimental heating and cooling system (2) Check-out systems and installation of instrumentation (3) Operate without crops to evaluate heating systems, instrumentation, and structure (4) Operate as a commercial type enterprise to evaluate mechanically and economically. (5) Connect facility to Sherburne County Plant when it goes into operation.

Plans/Progress: System has operated for nine months on electric boilers. It has produced one crop of tomatoes and a continuous crop of roses. Will operate for another year on power plant waste heat.

[illegible] Agricultural Engineering, Univ. of MN	[illegible]	[illegible]

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[illegible] X	[illegible] 21BP-161/4	[illegible] James P. Chasse [illegible] IERL/RTP

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
$100,000	76	0	05/20/75	07/01/77

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U.S. ENVIRONMENTAL PROTECTION AGENCY

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NOTICE OF RESEARCH PROJECT

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PROJECT NO. (DO NOT USE THIS SPACE)

[illegible]

TITLE OF PROJECT: Potential Beneficial Use of Waste Heat for Greenhouse Production of Bedding/Foliage Plants and Flowers

[illegible]

Principal Investigator: Dr. Isaac J. Crumbly, Assoc. Professor of Botany, Division of Science and Mathematics.

NAME AND ADDRESS OF APPLICANT INSTITUTION

Fort Valley State College
P.O. Box 1800
Fort Valley, GA 31030

[illegible]

Objectives: To determine the effects of the waste heat greenhouse environment on the production of cut flowers, foliage plants, and ornamental and vegetable bedding plants. To determine the crops which can most profitably be produced.

Approach: Two greenhouses, each 30x60 feet, will be constructed. One will be equipped with auxiliary boilers and heat exchangers to simulate a waste heat operation. The other will operate as a conventional greenhouse and serve as a control. The comparative performance of crops in the two different greenhouse environments will be monitored and the potential economic advantages of each determined.

Plans: Project was recently initiated. Greenhouse design is in progress.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED Division of Science and Mathematics	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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[illegible]	GRANT NO. R804461/0	PROJECT OFFICER James F. Chasse RESPONSIBLE ORGANIZATION IERL/RTP

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	EXPECTED COMPLETION DATE
$40,000	76	1	9/17/76	9/16/78

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

GMA

TITLE OF PROJECT: Power Plant Cooling Tower Blowdown Recycle by Vertical Tube Evaporation with Interface Enhancement. Mobile Pilot Plant Construction and Field Testing

[illegible]

Dr. Hugo H. Sephton, Research Chemist

NAME AND ADDRESS OF APPLICANT INSTITUTION

The Regents of the University of California, Campus Research Office, University of California, M-11 Wheeler Hall, Berkeley, Calif. [illegible]

SUMMARY OF PROPOSED WORK [illegible]

The main objective of this work is to develop and demonstrate under realistic field test conditions, a coolant blowdown renovation-recycle method for existing power plants, utilizing the novel interface-enhanced method of evaporation-concentration. This method provides significant capital and energy cost reductions.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR AGENCY USE ONLY

[illegible]	[illegible] 1	PROJECT OFFICER J. A. Roberts [illegible] [illegible], Corvallis, Oregon

[illegible]	76	[illegible]	[illegible]	[illegible]

EPA Form [illegible] REPLACES [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

[illegible]

CMA

TITLE OF PROJECT: Wastewater Renovation-Recycle for a Novel Power Plant Cooling Cycle Utilizing Irrigation Drainage with [illegible] and Evaporation

[illegible]

Dr. Hugo H. Sephton, Research Chemist, University of California,
Sea Water Conversion Laboratory; Richmond, California 94804

NAME AND ADDRESS OF APPLICANT INSTITUTION:
The Regents of the University of California;
c/o Campus Research Office; M-11 Wheeler Hall;
University of California; Berkeley, California 94720

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to determine the feasibility of recovering useful salts from the effluent of a power plant using irrigation drainage water as coolant. A novel combination of processes utilized in the coolant cycle provides a possible opportunity to recover calcium sulphate and sodium sulphate economically. The proposed work will involve an experimental determination of the phase diagrams that govern the crystallization of the above salts from typical mixed solutions, under process conditions that are realistic.

[illegible]
University (Coll. of Engineering)

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE
6/30/75

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[illegible]

1

Fred Roberts
EPA, ERL, Corvallis, Oregon

46,883

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STARTING DATE
10/1/76

[illegible]
10/1/77

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

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OMB No. [illegible]

[illegible]

OMB

TITLE OF PROJECT

Vermont Yankee Horticulture Economic and Quality Control Study

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Edmund P. Gaines, Jr., Ass't to the President, Vermont Yankee Nuclear Power Corp.
Raymond Sheldrake, Jr. - Professor, Dept. of Agriculture, Cornell U.
Otho S. Wells - Assoc. Prof. Dept of Agriculture, U. of N. H. (cont'd.)

NAME AND ADDRESS OF APPLICANT INSTITUTION

Vermont Yankee Nuclear Power Corp.
77 Grove Street
Rutland, Vt. 05701

SUMMARY OF PROPOSED WORK [illegible]

Examine current state-of-art for greenhouse climatic control using nuclear power plant waste heat for the enhancement of commercial horticulture. Identify through suitable liaison and information exchange, engineering design features of greenhouses and crop growing stations that have resulted from state and federally sponsored waste heat research programs. Select crop species having best commercial potential for growth in these structures when located in New England. Examine state and federal food quality regulations and determine their effect upon the economics of a horticulture operation using waste heat from the condenser of the Vermont Yankee Nuclear Power station. Review plant environmental monitoring records and take such other measurements as may be necessary to determine environmental changes created by the Vermont Yankee boiling water reactor and how such changes might affect an adjacent commercial horticulture operation. Develop an economic and marketing model of a commercial greenhouse, or other appropriate farming technique, whereby waste heat from the Vermont Yankee Nuclear plant condensers is used for crop growth-rate enhancement. The model will include all necessary plant operating parameters, crop specie growth characteristics, New England climatic conditions, New England marketing variables, and the effects of state and federal food quality control regulations.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A	Edmund P. Gaines, Jr.	April 9, 1976

FOR OFFICE USE ONLY

[illegible]	[illegible]	PROJECT OFFICER
[illegible]	3	James P. Chase EPA, ERL, Corvallis, Oregon

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	EXPECTED COMPLETION
20,000	76		10/1/76	9/30/77

EPA Form [illegible] [illegible]

U.S. GOVERNMENT PRINTING OFFICE [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]
SSIE
EPA-IAG-D5-E721-[redacted]

TITLE OF PROJECT
Advanced Waste Heat Control

[illegible]

Dr. H. B. Flora, II - Chemical Engineer
Power Research Staff
1320 Commerce Union Bank Building
Chattanooga, Tennessee 37401 Telephone 615/755-2001, FTS/854-2001

NAME AND ADDRESS OF APPLICANT INSTITUTION

Tennessee Valley Authority
Knoxville, Tennessee

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to (1) evaluate the use of membrane processes, e.g. reverse osmosis and ultrafiltration, for refurbishing power plant discharge waters; (2) investigate, evaluate, and determine whether one or more mechanisms may be beneficial in reducing impingement and/or entrainment, and (3) evaluate the engineering and environmental aspects of wet/dry cooling towers and to participate in the evaluation of the Thermo rotor spray system.

The approach includes: (1) review of available information along with laboratory studies and evaluation on commercially available reverse osmosis and ultrafiltration membranes to determining their ability to render power plant waste streams suitable for recycle, (2) review of available information and basic studies on the most promising mechanisms to reduce impingement and/or entrainment, and (3) studies and evaluations on the engineering and environmental problems associated with a prototype wet/dry cooling tower and the Thermo rotor spray system.

Current plans are to (1) continue laboratory work in the membrane studies, (2) continue studies and testing of promising mechanisms for reduction of fish impingement, and (3) continue work on obtaining a Westinghouse prototype wet/dry cooling tower and setting up a test program for its evaluation.

[illegible]
N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR
Hollis B Flora, II

DATE
9/27/74

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[illegible]

FUND NO.
5

PROJECT OFFICER
H. B. Flora, II

SPONSORING ORGANIZATION
Power Research Staff, TVA

[illegible]	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
[illegible]	1975	3 years	May 1973	December 1975

EPA Form 5760-1 (7-73) [illegible]

H. IMPROVED EFFICIENCY

TABLE OF CONTENTS

Improved Efficiency

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EPA	259-266

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

[illegible]

(IAG)

TITLE OF PROJECT

Combustion and Emission Tests on Portable Pyrolysis Char and Oil

[illegible]

Mr. Daniel Bienstock, Research Supervisor
Mr. Joseph J. Demeter, Supervisory Chemical Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

ERDA
Pittsburgh Energy Research Center
4800 Forbes Ave. Pittsburgh, PA. 15213

SUMMARY OF PROPOSED WORK [illegible]

Objective: This agreement between the ERDA-Pittsburgh Energy Research Center (PERC) and IERL (EPA) is for the purpose of running combustion and emission tests on the "fuel products" from an agricultural waste pyrolysis unit being investigated under EPA Research Grant No. R803430-01-0.

Approach: Char and oil will be shipped from Research grantee (Ga. Tech.) to Pittsburgh Energy Research Control for combustion in their test boilers. Combustion characteristics and air emissions will be evaluated and reported.

Status: "Fuel Product" being shipped from Ga. Tech. to PERC Combustion test should be completed by the end of Nov. 1976.

[illegible] None	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible] X INTERAGENCY AGREEMENT IAG	[illegible] 00	PROJECT OFFICER Walter W. Liberick Jr. RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
00,00	76	None	10/1/76	12/31/76

EPA Form 5700-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

[illegible] C083

TITLE OF PROJECT: Survey of Environmental Regulations and Pollution Control Technology

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

James D. Levin, Program Director	Jacob I. Bregman, Technical Advisor
David B. Sutar, Program Manager	Theo A. Dillaha, Staff Engineer
Gene V. Beeland, Research Analyst	Steven Wolf, Staff Engineer
S. P. Mathur, Senior Engineer	Penny L. Blackwell, Environmental Lawyer

NAME AND ADDRESS OF APPLICANT INSTITUTION
WAPORA, Inc.
6900 Wisconsin Avenue, N.W.
Washington, D. C. 20015

SUMMARY OF PROPOSED WORK [illegible]

The project will first identify the problems of environmental management in geothermal resource development. These problems will include air pollution, water pollution, solid waste disposal, land subsidence, seismic hazards, and noise levels. Legal, regulatory, and institutional constraints will also be considered. Each problem area will be discussed and alternative solutions will be cited where they exist. In some cases, it may be necessary to propose methodologies to achieve solutions where environmentally acceptable solutions do not currently exist.

The first phase of the program will be a survey of regulatory and institutional requirements pertaining to geothermal resource development. This will be done at the Federal, state, and local levels. From this information, the levels of treatment or other environmental controls required will be derived.

The second phase of the program will characterize geothermal resources and assess pollution control technology and attendant costs. This will include a survey of data from known geothermal reservoirs and an assessment of the applicability of current and developmental processes for exploration, development, and use to these resources. Pollution problems and/or other adverse environmental effects will be considered along with options for control. An evaluation of the research and development which is required to assure timely implementation of geothermal resources will be made, and compared with current research and development efforts.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR David B. Sutar	DATE 10/13/76

EPA OFFICE USE ONLY

[illegible]	TASK NO. 1A	PROJECT OFFICER Robert P. Hartley [illegible] EPA, ORD, OEMI, IERL-Ci

[illegible] 100,000	F.Y. 76	[illegible] 0	STARTING DATE 10/1/76	ESTIMATED COMPLETION DATE 10/1/76

EPA Form 1500-1 (7-73) REPLACES [illegible]

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Form Approved
OMB No. 158-R0011

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SSIE

EPA

CBG

TITLE OF PROJECT: **Environmental Assessment Of Geopressured Waters And Their Projected Uses**

[illegible]

[illegible], Project Mgr.
J.S. Wilson, Principal Investigator
P.E. Muehlberg, Research Specialist
J. Hamilton, Geologist
J.A. Henning, Research Specialist

NAME AND ADDRESS OF SUPPORTING INSTITUTION
Dow Chemical USA, Texas Division
Contract Research Dept.
Bldg. A-1214 Freeport, Texas 77541

SUMMARY OF PROPOSED WORK [illegible]

The project objective is to provide a preliminary environmental assessment of the potential uses of the geopressured geothermal waters of the Gulf Coast area of the United States. It will be accomplished by a literature survey and compilation of available data to characterize the resources. The acquired information will be used to describe the geopressured systems, potential and projected uses, potential multimedia emissions and effects, waste control requirements and control technology. Recommendations for environmental research will be made based upon the technical, environmental and economic feasibility of the projected uses.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A	J. S. Wilson	10/13/76

EPA OFFICE USE ONLY

[illegible]	[illegible]	PROJECT OFFICER
X	58	Robert P. Hartley [illegible] EPA, ORD, OEHT, IERL-Ci

[illegible]	[illegible]	[illegible]	STARTING DATE	[illegible]
$31,170	24	0	9/1/76	11/30/76

[illegible]

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. [illegible]

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

CBO

TITLE OF PROJECT

Underground Storage of Waste

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Pennsylvania Department of Environmental Resources and Contractor

NAME AND ADDRESS OF APPLICANT INSTITUTION

Pennsylvania Department of Environmental Resources
P. O. Box 2063
Harrisburg, Pennsylvania 17120

SUMMARY OF PROPOSED WORK [illegible]

The Bureau of Land Protection, Department of Environmental Resources is attempting to evaluate the feasibility of using FGD sludges and fly ash to abate acid drainage from abandoned deep mines and to prevent mine subsidence. Scope of the investigation will compile existing data, derive experimental data, study the physical and chemical properties of FGD products, and evaluate the chemical compatibility of the products with the mine environment. The project includes a social-economic analysis, preparation of preliminary engineering parameters for demonstration, and an evaluation of the effectiveness of this concept.

[illegible] N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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☒ [illegible]	[illegible] 08-02-02A-01	PROJECT OFFICER R. Jackson Hubbard [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

C103

TITLE OF PROJECT: Preliminary Environmental Assessment of Solar Energy Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

D. B. Sears, Project Manager

NAME AND ADDRESS OF PERFORMING INSTITUTION:

Lockheed Missiles and Space Co., Inc.
Huntsville Research & Engineering Center
P.O. Box 1103
Huntsville, Ala. 35807

SUMMARY OF PROPOSED WORK [illegible]

The objective is to provide a preliminary environmental assessment of solar energy power generation systems which utilize photovoltaics, flat plate collectors, and energy concentrators. It will be accomplished by surveying the existing technical literature and by interviewing knowledgeable personnel. Subjects to be addressed include air and water quality, thermal pollution, and solid wastes, pollution eliminated by not burning fossil fuels, weather modification, land use impacts, and effects of secondary manufacturing needs.

Ongoing federally sponsored related research will be compiled and further research needs will be identified.

[illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
N/A	D. B. Sears	10/13/76

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[illegible]	TYPE NO.	PROJECT OFFICER
X	7A	Robert P. Hartley EPA, ORD, IERL, [illegible]

[illegible]	[illegible]	[illegible]	STARTING DATE	[illegible]
$15,000	76	0	10/1/76	11/76

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

NOTICE OF RESEARCH PROJECT

PROJECT NO. (Do not use this space)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

EPA
ROAP 1BB3

TITLE OF PROJECT: Development Status and Environmental Hazards of Several Advanced Energy Systems

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:
Morris Yanny and Sidney Bourgeois
Lockheed-Huntsville Research and Engineering Center

NAME AND ADDRESS OF APPLICANT INSTITUTION
P.O. Box 1103
Huntsville, Alabama 35807

SUMMARY OF PROPOSED WORK [illegible]

The report gives a review of the development status of several advanced energy concepts and discusses the primary environmental hazards of each system. Systems reviewed include potential new sources of energy and improved energy conversion. Considered were: ocean thermal gradients, wind power, magnetohydrodynamics, hydrogen fuel cells, potassium cycles, high temperature turbines, thermionic, thermoelectric and electrogasdynamic energy systems. Each system is evaluated with respect to its development status, and estimates are made as to when each will begin to contribute significantly to U.S. Energy needs. Appraisals were made of the environmental impact of each system including assessment of the adequacy of control technology and potential gross ecological impact. The overall conclusion is that each energy system has a negligible or mild direct environmental impact when compared with conventional fossil fuel and nuclear systems, but that indirect impacts for some of the energy systems could be severe and need further study to quantify their impact.

IDENTIFY PROFESSIONAL SCHOOL LEVEL (IF IN MEDICAL) [illegible]
SIGNATURE OF PRINCIPAL INVESTIGATOR
DATE

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SUPPORT ACTION (Check one)
TARGET STATE [illegible]
X CONTINUING [illegible]
[illegible]

TASK NO.
07-01-01A

PROJECT OFFICER
M. Gage
RESPONSIBLE ORGANIZATION
IERL-Cincinnati

FUNDS OBLIGATED
F.Y.
[illegible]
STARTING DATE
6/76
ESTIMATED COMPLETION DATE
6/76

EPA Form 5380-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved [illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT: Development of Control Technology which Abates Air Pollution and Conserves Energy in Glass Melting Furnaces

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK [illegible]

Objectives: To evaluate thru the pilot plant stage systems for pelletizing the glass furnace charge material and preheating this charge by passing furnace exhaust thru the charge prior to placing it in the melting furnace.

Approach: Bench scale development on pelletizing equipment and preheater design and criteria will preceeded the design construction and development testing of a complete pilot plant which will mix, pelletize and dry the ingredients for the furnace charge, transport the pellets to a preheater where they will be heated by the furnace exhaust to the maximum possible without melting. Energy and exhaust pollution reductions will be measured.

Progress: The contractor has been selected. Award is expected late in 1976.

[illegible] PROFESSIONAL [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10/7/76

FOR OFFICE USE ONLY

SUPPORT [illegible]	TASK NO. 07-05-03A	PROJECT OFFICER M. Sato SUPPORTING ORGANIZATION IERL-Cincinnati
FUNDS OBLIGATED	[illegible]	STARTING DATE	EXPECTED COMPLETION DATE

EPA Form 5720-1 [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0001

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT

Preliminary Environmental Assessment of the Production and Use of Methanol from [illegible]

W. Ballantyne
B. Singh
G. T. [illegible]

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle-Columbus Laboratories
505 King Avenue, Columbus, Ohio 43201

[illegible]

The possible environmental problems incurred with the production of methanol fuel from biomass waste and the distribution and use of the fuel have not been carefully investigated. It is the subject of this study to define and categorize these problems and suggest areas where additional research is believed necessary.

If biomass-to-methanol conversion processes and the subsequent use of methanol fuel does become a viable industry, the commercial development would create activities and sources with potential for environmental impact. Reported will be results of a preliminary study to assess the status of methanol-related synthetic fuel production and the potential environmental problems associated with the production, distribution, and use of methanol fuel.

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE
10/7/76

FOR OFFICE USE ONLY

27-03-01A

PROJECT OFFICER
[illegible]
IERL-Cincinnati, EPA/ORD

$ 11,000

76

EFFECTIVE DATE
February 1976

ESTIMATED COMPLETION DATE
December 1976

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PROJECT NO. (DO NOT USE THIS SPACE)

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT
Environmental Assessment of Advanced Energy Conversion Technologies

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Harry Shaw, Government Research Laboratories, Project Head, Advanced Energy Systems
Dr. John P. Longwell, Corporate Research Laboratories, Senior Scientific Advisor
Dr. George S. [illegible], MIT, Energy Laboratory Staff, Program Coordinator
Mr. E. J. [illegible], [illegible], Inc., Senior Engineer, Modeling Consultant

NAME AND ADDRESS OF APPLICANT INSTITUTION
Exxon Research and Engineering Company
Government Research Laboratories
P. O. Box 8
Linden, New Jersey 07036

Subcontractor:
Massachusetts Institute of Technology
Energy Laboratory
Cambridge, Massachusetts 02139

SUMMARY OF PROPOSED WORK [illegible]

The potential environmental impact of advanced energy conversion technologies will be assessed in a 4 phase program over the next three years in order to avoid the need for retrofitting control equipment when these plants are a commercial reality. The advanced cycles to be considered in this program include: open and closed cycle magnetohydrodynamics (MHD), open and closed cycle high temperature gas turbines, liquid metal topping cycles, supercritical CO_2 cycles (Feher), thermionics, fuel cells, advanced steam cycles (Field), and bottoming cycles.

The Phase I effort will consolidate the available information on the potential pollutants as well as the current state of development of advanced conversion technologies. The objective of Phase II will be to develop realistic and practical analytical models in order to estimate effluents, pollutants, and waste energy. These models will be employed to provide parametric analyses of emission levels related to cycle characteristics and efficiency. The cost/effectiveness of existing pollution control technologies for each cycle will then be determined. The Phase III field and laboratory testing effort will be carefully designed to provide a preliminary environmental assessment of each cycle tested. Sufficient data will be obtained to fill in the critical data gaps and thus calibrate and validate the cycle models. Phase IV of the program will use all the information and data generated in the program to identify the critical R&D needed to make these technologies environmentally acceptable. The impact of pollution control on energy conversion efficiency will be stressed in the recommendation. This planning effort will include alternate R&D strategies and priorities based on anticipated ranges of available funding.

SIGNATURE OF PRINCIPAL INVESTIGATOR
Harry Shaw

DATE
April 11, 1975

[illegible]

68-02-1415

Harry Shaw

6/76

10/76

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]
PROJECT NO. [illegible]
[illegible]

TITLE OF PROJECT
Energy Consumption from Present Pollution Control Technology

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.
Dr. Richard A. Hockett

NAME AND ADDRESS OF APPLICANT INSTITUTION
Monsanto Research Corporation

SUMMARY OF PROPOSED WORK – (1) Objectives (2) Approach (3) Current Plans and/or Progress (200 words or less). In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

Objectives: The objectives of this task are: (1) to assess the existence of and accuracy of pollution control energy cost estimates, and (2) to assess, in the light of shortages and increasing cost of energy, the need for modification of present approaches to pollution control. Within the time constraints of the project, the object is to obtain as broad a perspective as possible on the problem area for EPA program planning purposes.

Scope of Work: The two objectives for this project will be met by the following two subtasks: **Subtask 1** - Survey the open literature and make personal contacts to identify previous efforts and success in determining the energy costs of pollution control. Interest is in industrial and utility stationary point sources and in the related air, water, and solids pollution control throughout the U. S. economy. Analyze the deficiencies and assumptions in previous work. Suggest alternative approaches to obtaining better cost data (125 manhours). **Subtask 2** - Identify the relative energy uses of various pollution control strategies now in use to determine the most important areas for reducing energy consumption. The basis should be present industry production capacity, but with anticipated pollution control assumed to be installed to satisfy present regulations. It may be appropriate to consider categories of pollutants, i.e., NO_x, SO_2, hydrocarbons, BOD, COD, trace organics in water, etc., rather than industry categories, in making comparisons. Alternatives to pollution control that are less energy intensive should be identified and prioritized. Emphasis should be placed on modifications of existing processes rather than on totally new approaches (375 manhours).

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT (Check one) ☐ [illegible] ☐ [illegible] ☒ [illegible] ☐ [illegible]	FILE NO. 07-07-93A	PROJECT OFFICER C. C. Lee RESPONSIBLE ORGANIZATION PTCB, [illegible], IERL-Ci

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$10K	76	0	1/76	11/76

EPA Form [illegible] [illegible]

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NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. (DO NOT USE THIS SPACE)

[illegible]

TITLE OF PROJECT: First Annual Report of the National Advisory Council on Research in Energy Conservation. Energy Conservation Research: A Key to Resolving the National Energy [illegible]

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Leo A. Daly FAIA (Chairman) NACREC

NAME AND ADDRESS OF APPLICANT INSTITUTION
The National Advisory Council on Research in Energy Conservation
c/o Charles W. Williams Inc.
301 North Fitt Street
Alexandria, Virginia 22314

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

Objective: A comprehensive, unbiased view of energy conservation research and activities is the objective of this report. Key factors include:

- (1) Concepts of conservation which do not require a reduced standard of living or diminished quality of life.
- (2) An overall framework for evaluating the dynamics of national energy policies.
- (3) Integrated views of present energy supply/demand forecasts and of present conservation research activities.
- (4) A comprehensive framework for balanced national research programs.
- (5) Initial suggestions for appropriate funding levels and for the composition of a balanced national program for energy conservation research.
- (6) A specific framework for a national program of research on energy conservation in the built environment.

Approach: Gather and present statistics on and status of energy conservation work in the built environment.

Status: Report Published December 1975

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, OTHER, ETC.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO.	PROJECT OFFICER
[illegible]	07-07-03A	David Berg
[illegible]		RESPONSIBLE ORGANIZATION
[illegible]		IERL-Ci

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
3,000	76			

EPA Form 5760-1 [illegible] REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

[illegible]

TITLE OF PROJECT: Environmental, Economic, and Conservation Aspects of Integrated Energy Use Applications

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Mr. H.F. Simmer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Georgia Institute of Technology

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

The purpose of this project is to provide up-to-date analyses of the environmental, economic and technical feasibility of alternatives for supplying total energy needs, to assess various integrated energy system concepts for supplying multipurpose energy for utility and industrial needs, to identify the technical feasibility of matching industrial processes to thermal outputs of power plants, to analyze extensively several final concepts selected for their potential for future environmentally sound developments, and to make recommendations about future environmental research and development activities based on the project results.

This research study will follow a phase-oriented program to achieve its objectives. Five phases have been identified and are listed below:

Phase 1: Project management;
Phase 2: Environmental, economic and technological overview and preliminary
concept identification;
Phase 3: Methodology development and final concept selection;
Phase 4: Concept analysis and evaluation;
Phase 5: Conclusion and recommendation.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (if any)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD (Check one) [illegible]	TASK NO. 01-07-04A	PROJECT OFFICER H. C. Lee RESPONSIBLE ORGANIZATION PTCB, IERL-CI

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
70K	75		6/76	1/78

EPA Form [illegible] [illegible]

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Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)

SIE

[illegible]

TITLE OF PROJECT

Environmental Assessment of Waste-to-Energy

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

H. F. Schrag, Project Director

NAME AND ADDRESS OF APPLICANT INSTITUTION

Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible] Summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

The objective of this project is to characterize the liquid, gaseous, and solid emission from various waste to energy systems. The characterization will be based on actual data obtained from on-site sampling operations. The first report from this project will be distributed in July [illegible]. This is a 3-year project.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (M.D., D.D.S., etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ AGENCY STAFF (In-house) ☒ NEGOTIATED CONTRACT ☐ RESEARCH GRANT	TASK NO. 07-08-05A	PROJECT OFFICER H. M. Freeman RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	FY	PROFESSIONAL MAN-YEARS (CURRENT FY)	STARTING DATE	ESTIMATED COMPLETION DATE
$400K $317K	77 78	3	10/76	9/79

EPA Form 5760-1 (7-75) REPLACES EPA FORM 182 AND SIE-IE 182 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

CBGG

TITLE OF PROJECT

Evaluation of Waste-to-Energy Processes

[illegible] PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

R. M. Wilson, Project Manager

NAME AND ADDRESS OF APPLICANT INSTITUTION

Ralph M. Parsons Company
Pasadena, California

SUMMARY OF PROPOSED WORK [illegible]

The objective of this project is to provide an objective third-party engineering evaluation of emerging waste-to-energy processes. The evaluation is to include cost figures and potential technical problems for the most prominent of the current and developing processes. A final report from this work will be available during the first quarter of 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]
☐ AGENCY STAFF [illegible]
☒ [illegible] CONTRACT
☐ [illegible] GRANT

TASK NO. 07-10-08A

PROJECT OFFICER H. M. Freeman

RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$585,000	76	0	6/75	3/77
$ 44,000	7T			

EPA Form 5700-1 (7-73) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

SSIE

TITLE OF PROJECT: St. Louis Waste Co-Firing with Coal Project: Equipment, Facilities and [illegible]

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

P. G. Gorman
L. J. Shannon
M. P. Schrag
D. E. Fiscus

NAME AND ADDRESS OF APPLICANT INSTITUTION

Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

SUMMARY OF PROPOSED WORK – [illegible]

As part of an EPA demonstration grant, the City of St. Louis has been processing municipal solid waste and the Union Electric Utility has been firing it as an auxiliary fuel at the Meramec Power Plant. The feasibility of the concept has been demonstrated but more data of a substantive nature is being sought from the program. This procurement is to provide services to fully test and evaluate the refuse preparation and firing processes.

Specifically, this project provides for tests to determine the effects of firing refuse and coal on gases and particles emitted from a 130 MW tangentially fired utility boiler. Tests will be made to investigate the mechanisms which cause a loss in ESP performance. Water pollution tests will be conducted and the emission of potentially hazardous pollutants will be investigated. Testing and engineering analyses will be performed to technically and economically evaluate the refuse preparation and firing processes. Requirements for design of emission control devices will be established and process or equipment modifications necessary to reduce process cost and to increase energy or material recovery will be determined.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one)
AGENCY STAFF (Intramural)
X NEGOTIATED CONTRACT
RESEARCH GRANT

TASK NO. 07-10-10A

PROJECT OFFICER [illegible]

RESPONSIBLE ORGANIZATION MERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS TENTATIVELY PLANNED BEYOND CURRENT F.Y.	STARTING DATE	ESTIMATED COMPLETION DATE
$ [illegible]	76			
[illegible]	7A	NONE	6/76	9/77

EPA Form 5760-1 (7-73) REPLACES PHS FORM 166 AND SSIE 166 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0081

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (Do not use this space)
SSIE
CB03

TITLE OF PROJECT
Evaluation of Ames' Waste Process -- An Energy Recovery System

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT
A.O. Chantland, Project Manager, Public Works Director (Ames)
Dr. L. J. Shannon, Midwest Research Institute
Dr. A. W. Joensen, Iowa State University
Dr. D.R. Bowman, Director, ERI, Iowa State University

NAME AND ADDRESS OF APPLICANT INSTITUTION

City of Ames, Iowa 50010

SUMMARY OF PROPOSED WORK -- (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. In the Smithsonian Science Information Exchange, summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

The study will assess the effects of using municipal solid waste (MSW) as a supplemental fuel. Co-firing of MSW with coal in stoker and tangentially-fired boilers will be conducted and since one boiler is the same as at St. Louis, studies will permit confirmation, and comparison of selected St. Louis results. Assessments will be made of the technical and environmental aspects of these co-firing techniques. In addition, technical and economic tests and evaluations will be conducted on the second generation MSW processing facility associated with supplying the refuse derived fuel.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.) Engineering & Scientific	SIGNATURE OF PRINCIPAL INVESTIGATOR A. O. Chantland	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) AGENCY STAFF (Intramural) NEGOTIATED CONTRACT X RESEARCH GRANT	TASK NO. 07-10-11A	PROJECT OFFICER C. Wiles/D. Oberacker ORGANIZATION LOCATION MERL/SHWRL-Cincinnati, EPA/ORD

FUNDS OBLIGATED $ (Net Amount) $ 75,057	F/Y 76	NO. OF FUTURE YEARS TENTATIVELY PLANNED BEYOND CURRENT F.Y. none	STARTING DATE 8/76	ESTIMATED COMPLETION DATE 8/78

EPA Form 5760-1 (7-73) REPLACES PHS FORM 166 AND SI-SIE 164 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)

[illegible]

TITLE OF PROJECT

Environmental Effect of Utilizing Solid Waste as a Supplementary Power-Plant Fuel

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THIS PROJECT

Dale A. Vaughan	Senior Research Scientist	Materials Science Dept., Corrosion Research Section
W.K. Boyd	Manager	" " "
[illegible]	Researcher	Atmospheric Sciences Section
[illegible]	Senior Researcher	Fuels and Combustion Systems Section

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle Columbus Laboratories
505 King Avenue, Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

The objective of this project is to investigate the benefits to the environment resulting from the utilization of solid waste as a supplementary fuel in existing coal-fired power plants.

The approach is to evaluate the gaseous and particulate emission plus the corrosiveness of combustion products as a function of refuse-coal ratio and as a function of sulfur content of the coal. Experiments will be conducted in an operating power station through cooperation of the City of Columbus, Ohio.

Furnace and stack gas and particulate samples will be collected throughout the periods that corrosion probes are inserted at several locations in the heat-recovery passes. These probes will be examined for corrosion attack and deposit composition for various gas and metal temperatures to provide guidance in future utilization of solid waste as a supplementary fuel.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (IF APPLICABLE)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10-1-76

FOR OFFICE USE ONLY

SUPPORT METHOD
AGENCY STAFF (INTRAMURAL)
NEGOTIATED CONTRACT
RESEARCH GRANT

[illegible]
[illegible]-10-12A

PROJECT OFFICER
R. [illegible]

RESPONSIBLE ORGANIZATION
IERL-Cincinnati, EPA/ORD

FUNDS ALLOCATED	F.Y.	NO. OF FULL-TIME STAFF YEARS	STARTING DATE	ESTIMATED COMPLETION DATE
120,000 [illegible] [illegible]	76 [illegible] [illegible]	One	6/12/76	6/11/77

EPA Form 5760-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. 158-R0061

PROJECT NO. (Do not use this space)

DATE

CBG

TITLE OF PROJECT

Preparation, Use and Cost of d-RDF as a Supplementary Fuel in Stoker Fired Boilers

NAMES, DEPARTMENTS, AND TITLES OF PRINCIPAL INVESTIGATORS AND OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Dr. Harvey Alter, Director of Research Programs
Mr. Stu Natof, Staff Engineer
Mr. Gil Jackson, Chemical Engineer
Mr. Waldrop, Staff Test Engineer
Mr. William [illegible], Supt. of Operations

NAME AND ADDRESS OF SUPPORTING INSTITUTION

National Center for Resource Recovery, Inc.
1211 Connecticut Avenue, N.W.
Washington, D.C. 20036

SUMMARY OF PROPOSED WORK -- (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Do not use confidential data. [illegible] to the Smithsonian Science Information Exchange. Summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. This summary is to be used for these purposes.

This Research Grant involves the study of the technical and economic aspects of preparing and using densified forms of municipal solid waste as a supplementary fuel in industrial and institutional stoker coal fired boilers. Investigations will be conducted to establish methodology for preparing densified refuse derived fuel (d-RDF). Process and product characterizations will be developed to enable establishment of specifications for d-RDF. Densification forms will include pellets, briquettes, and cubettes. Independent boiler burn tests and operations will be conducted in conjunction with this research to fully characterize the concept.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR Dr. Harvey Alter	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ AGENCY STAFF (Intramural) ☐ NEGOTIATED CONTRACT ☒ RESEARCH GRANT	TASK NO. 07-10-14A	PROJECT OFFICER C. Wiles/R. Olexsey RESPONSIBLE ORGANIZATION MERL/[illegible]-Cincinnati, EPA/ORD

FUNDS OBLIGATED $770,484	F.Y. 76	NO. OF PERSON-YEARS (EPA STAFF ONLY) [illegible] --	STARTING DATE 9/1/76	ESTIMATED COMPLETION DATE 8/31/77

EPA Form 5700-1 (2-73) REPLACES PHS FORM 166 AND SI-SIE 101 WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

PROJECT NO. (Do not use this space)

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

CBD

TITLE OF PROJECT: Effects of Burning Densified Forms of Municipal Solid Wastes Derived Fuels in Industrial, Utility, and Institutional Stoker-Fired Boilers

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Melvin D. Eifert, Vice-President of Engineering
H. Gregor Rigo, Ph.D., Program Manager
Boyd T. Riley, Ph.D., Consultant
Lloyd W. Anderson, Manager of Engineering Services
[illegible], Ph.D., Manager of Engineering Research

NAME AND ADDRESS OF ORIGINATING INSTITUTION

Systems Technology Corporation
245 North Valley Road
Xenia, Ohio 45385

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. [illegible] to the Smithsonian Science Information Exchange. Summaries of work in progress are exchanged with government and private agencies supporting research and are forwarded to investigators who request such information. Your summary is to be used for these purposes.

The objective of this program is to demonstrate the use of densified Refuse Derived Fuel (d-RDF) as a coal supplement in stoker-equipped boilers and to assess the environmental impact of widespread implementation of the concept.

The questions are to be answered by burning pelletized, cubetted and briquetted d-RDF and coal in spreader stoker-equipped boilers. The coal: d-RDF ratio will be varied to establish the impact of substitution ratio on boiler performance and the environment. After initial testing is complete, a demonstration burn will occur to assess the impact of sustained firing. Each fuel-boiler combination will be approached in a three step sequence: (1) A field trial will establish the processability of the fuel by the boiler and the maximum substitution ratios usable without boiler problems; (2) A field test will quantify environmental, energy and boiler impacts of the fuel system over a range of boiler conditions; (3) A demonstration will be performed.

The program schedule calls for initiation of testing in September 1976, and completion in July 1977 with the draft report complete in October 1977.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) AGENCY STAFF (In-house) INTERAGENCY [illegible] X CONTRACT RESEARCH GRANT	TASK NO. 07-10-14A	PROJECT OFFICER [illegible] MERL/[illegible]-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS [illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$393,400	76	None	9/29/76	9/29/77

EPA Form 5760-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY **NOTICE OF RESEARCH PROJECT**	Form Approved OMB No. [illegible]
	PROJECT NO. (Do not use this space) SSIE
PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE	[illegible]

TITLE OF PROJECT

Wood Waste as a Power Plant Fuel in the Ozarks

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Virgil J. Flanigan, Associate Professor of Mechanical Engineering, Department of Mechanical and Aerospace Engineering

NAME AND ADDRESS OF APPLICANT INSTITUTION

University of Missouri - Rolla
Rolla, Missouri 65401

SUMMARY OF PROPOSED WORK – (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

It is proposed that part of the large reserves and part of the production of oak wood waste in the Ozark region be used as a boiler fuel. The waste is to be blended with coal to take advantage of existing furnace design. The blend is to be optimized for stack conditions, ash content, amount of fuel, boiler efficiency, and economics.

The objectives of the project are to assist the wood products industry with its problems in using and disposing of wood waste and to examine the environmental consequences of co-firing wood waste with coal.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible] School of Engineering	SIGNATURE OF PRINCIPAL INVESTIGATOR V.J. Flanigan	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ AGENCY STAFF (In-house) ☐ NEGOTIATED CONTRACT ☒ RESEARCH GRANT	FILE NO. 07-11-35A	PROJECT OFFICER H. R. Freeman RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED $50,000	F.Y. 76	NO. ADDITIONAL YEARS TENTATIVELY REQUIRED BEYOND CURRENT F.Y.	STARTING DATE 10/1/76	ESTIMATED COMPLETION DATE 9/30/77

EPA Form 5720-1 (7-73)   REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. 158-R0061

PROJECT NO. (Do not use this space)

SSIE

CSG

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

TITLE OF PROJECT:
Conversion of Solid Waste to Polymer Gasoline

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Charles B. Benham, Research Aerospace Engineer

James P. Diebold, Chemical Engineer

NAME AND ADDRESS OF APPLICANT INSTITUTION

Naval Weapons Center
China Lake, California 93555

SUMMARY OF PROPOSED WORK — (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). Omit confidential data. [illegible]

Objective: To determine the feasibility, both technical and economic, of pyrolyzing the organic fraction of municipal solid waste to sufficient quantity of hydrocarbon gases (ethylene, ethane, etc) to produce chemical intermediates. Phase I of subsequent studies are directed towards the polymerization of hydrocarbon fraction to liquid fuel (polymer gasoline) suitable for internal combustion engine operation.

Approach: 1. An existing pyrolysis unit will be operated under various conditions to maximize the production of unsaturated hydrocarbons.
2. A polymerization unit will be designed, fabricated and added to the pyrolysis unit.
3. Data will be obtained over a wide variety of conditions using the combined pyrolysis and polymerization units. Compositional analysis of pyrolysis and polymerization products will be performed for each test condition.
4. Preliminary design of a scaled-up pilot plant will be developed.

Progress: Studies have been conducted with the pyrolysis unit to optimize the unsaturated hydrocarbons in the off-gases. Separate studies have been made on a gas cleaning system and a thermal polymerization unit. Polymer gasoline has been produced from the polymerization unit using a combination of bottle gases simulating the gas mixture from the pyrolysis unit.

Future tests involve using gases from the pyrolysis unit in the gas cleaning system and the polymerization unit and again optimize operating parameters.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.) None	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE 10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one) ☐ AGENCY STAFF (Intramural) ☒ NEGOTIATED CONTRACT IAG ☐ RESEARCH GRANT	TASK NO. 07-12-20A	PROJECT OFFICER Walter Liberick, Jr. RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS TENTATIVELY SOUGHT BEYOND CURRENT F.Y.	STARTING DATE	ESTIMATED COMPLETION DATE
[illegible]	76 TQ 77	None	6/11/75	6/77

EPA Form 5760-1 (7-73) REPLACES PHS FORM 166 AND SI-SIE 166 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]
PROJECT NO. (DO NOT USE THIS SPACE)
[illegible]

TITLE OF PROJECT:
Pilot Scale Pyrolytic Conversion of Mixed Waste to Fuel

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Project Director: Dr. John Howard
Project Manager: Mr. Richard R. Stephens

NAME AND ADDRESS OF APPLICANT INSTITUTION
Energy Resources Co. Inc.
185 Alewife Brook Parkway
Cambridge, MA 02138

SUMMARY OF PROPOSED WORK [illegible]

Objectives: To develop models relating fraction of fuel products (gas, liquid, solid) produced in pyrolysis of various types of solid wastes as function of pyrolysis conditions. Solid wastes include mixed municipal, agricultural, and industrial wastes. An investigation of chemical conversions including steam gasification, partial oxidation, and catalytic effects of bed materials, as well as detailed analysis and characterization of pyrolysis products including char and oil, will be conducted.

Approach: Experimental study using small batch pyrolyzer and pilot size (300 kg/hr) fluidized bed pyrolyzer to produce data for model development and verification. Statistical and semi-empirical models will be examined for the normal fluidized bed pyrolytic technique as well as for steam gasification and partial oxidation. Several char and oil samples will be analyzed in detail to evaluate the acceptability of fuel products.

Status: Fabrication of the test units is completed. Test runs are under way to accumulate data for model verification.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
None		10-7-76

FOR OFFICIAL USE ONLY

SUPPORT METHOD (Check one)	TASK NO.	PROJECT OFFICER
☐ AGENCY STAFF (Intramural)	07-13-22A	Richard Chapman
☒ NEGOTIATED CONTRACT		RESPONSIBLE ORGANIZATION
☐ RESEARCH GRANT		IERL-Cincinnati, ETA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS SUPPORT	STARTING DATE	ESTIMATED COMPLETION DATE
[illegible]	76			
[illegible]	76	None	7/1/76	12/30/77

EPA Form 5740-1 (7-74) REPLACES PHS FORM 166 AND SI-SIE 166 WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]
PROJECT NO. (Do not use this space)
SSIE
[illegible]

TITLE OF PROJECT Development of a Prototype Portable System for Pyrolysis of Agricultural Wastes into Fuels and Other Products

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

Dr. Kenneth Purdy, Principal Research Engineer
Dr. James A. Knight, Principal Research Scientist

NAME AND ADDRESS OF APPLICANT INSTITUTION
Georgia Institute of Technology - Engineering Experiment Station
225 Administration Building
Atlanta, Georgia 30332

SUMMARY OF PROPOSED WORK - (1) Objectives, (2) Approach, (3) Current Plans and/or Progress (200 words or less). [illegible]

Agricultural wastes accumulate in the U. S. at the rate of more than 800 million dry tons/year and represent a continuing nuisance and pollution source in the rural environment. Conversely, these wastes represent a potential source of sulfur free fuel and other chemical products. However, the great distances that these wastes must be hauled, their large moisture content, and the necessity for construction of new boilers or furnaces to burn them have made traditional waste utilization concepts impractical or marginal at best. The proposed program, however, involves the design, fabrication, and test of a portable pyrolytic conversion system capable of converting these bulky wet low energy wastes into a dense dry high energy fuel at the source of their original production, thereby saving more than 75% of the transportation costs. Further, the form of these fuels is such that they can be used in existing conventional coal fired boilers and/or mixed with high sulfur coal to form an acceptable low sulfur fuel.

In addition, the study will investigate the potential uses of the pyrolysis products other than as fuels, but including the production of methyl-fuel. The latter fuels, because they are liquid, could be used by farmers to operate their equipment, dry their crops, and heat their homes and barns, thus making them almost self sufficient, energy-wise.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (Medical, Dental, etc.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
		10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD (Check one)	PPAS NO.	PROJECT OFFICER
☐ AGENCY STAFF (In-House)	01-13-03A	Walter W. Liberick, Jr.
☐ [illegible]		ORGANIZATIONAL IDENTIFICATION
☒ RESEARCH GRANT		IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	NO. OF FUTURE YEARS TENTATIVELY REQUIRED BEYOND CURRENT F.Y.	STARTING DATE	ESTIMATED COMPLETION DATE
$74,776	76			
$74,000	76	none	8/1/76	7/31/77

EPA Form 5780-1 (7-73) REPLACES EPA FORM [illegible] WHICH MAY NOT BE USED

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
OMB No. [illegible]

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT: Technical Assessment of Air Pollution Control for SO_2, NO_x and Other Air Emissions at the Baltimore Demonstration Gas Pyrolysis Facility

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Mr. Tony B. Eggleston

NAME AND ADDRESS OF APPLICANT INSTITUTION:
The Systems Group
TRW, Inc.
One Space Park
Redondo Beach, Calif. 90278

SUMMARY OF PROPOSED WORK [illegible]

Objective: The overall objective of this task is to assess SO_2, NO_x and other air emissions from Baltimore, Maryland, Demonstration Gas Pyrolysis Facility.

Approach: Contractor will develop the sample plan for all constituents, collect required samples, perform required analysis, interpret the data and provide a written report of results.

Status: Contractor awaiting the continuous operation of Baltimore Plant to collect samples and proceed with the stated objectives.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
None		10-7-76

FOR OFFICE USE ONLY

SUPPORT METHOD	TASK NO.	PROJECT OFFICER
[illegible]	07-13-26A	Walter W. Liberick, Jr. [illegible] IERL-Cincinnati, EPA/ORD

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
007.4740	76	None	4/22/76	1/22/77

EPA Form 5760-1 [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Form Approved
OMB No. [illegible]

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. (DO NOT USE THIS SPACE)
EPA
[illegible]

TITLE OF PROJECT
Co-Incineration of Sewage Sludge with Refuse and/or Coal

GIVE NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.
Dale C. Bergstedt, Deputy Director of Operations 612/222/-8423
Wilbur A. Klein, Chief Process Engineer
Gary J. [illegible], Staff Engineer
Robert L. Hughes, Superintendent, Seneca Wastewater Treatment Plant

NAME AND ADDRESS OF APPLICANT INSTITUTION
Metropolitan Waste Control Commission
350 Metro Square Building
St. Paul, Minnesota 55101

SUMMARY OF PROPOSED WORK [illegible]

Purpose of the project is to evaluate the operational worth and environmental aspects, if any, of adding combustible solid matter to wastewater plant sludges and filter cakes, as offsets to part or all of the fuels conventionally used in sludge incineration practice. Impending shortages of natural gas and fuel oil create the sense of urgency in this work. Low-sulfur coal and combustible solid wastes will be utilized as admix materials in various test sequences. Wastes to be tried include shredded combustibles from refuse, in pelletized and loose form, wood chips from urban tree-trimming, shredded tires, and industrial combustible wastes. A full-scale multiple hearth furnace in a modern wastewater treatment plant will be used. Applicability to other incinerators of the 300-plus total in United States' communities will be assessed. Assay of stack gases, after scrubbing, will include relevant chemical properties of public health significance. Scrubber drainage and ash will also be assayed.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.) N/A	SIGNATURE OF PRINCIPAL INVESTIGATOR Dale C. Bergstedt	DATE 10-7-75

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☐ [illegible] ☐ [illegible] ☐ [illegible] ☒ [illegible]	TASK NO. [illegible]	PROJECT OFFICER Steve Hathaway RESPONSIBLE ORGANIZATION EPA, WSD, MERL, Cincinnati, Ohio

(1) [illegible] (2) [illegible]	FY 76	[illegible] N/A	STARTING DATE 6/01/75	ESTIMATED COMPLETION DATE 7/31/77

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

[illegible]

TITLE OF PROJECT

Annual Report—National Council for Research in Energy Conservation

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

Charles W. Williams, President of Charles W. Williams, Inc.
Dr. John P. [illegible], Senior Staff Associate, Charles W. Williams, Inc.

NAME AND ADDRESS OF APPLICANT INSTITUTION

National Council for Research in Energy Conservation

SUMMARY OF PROPOSED WORK [illegible]

1. Objective - This project supports the researching and writing of the first annual report of the National Advisory Council on Research in Energy Conservation. The report for the current year will deal with energy conservation in the built environment - an area with substantial potential for improving environmental conditions.

2. Approach - Council will survey current research dealing with energy conservation in buildings, identify the gaps or overlaps in ongoing research and make recommendations for additional research. Environmental impacts will also be examined.

3. Plans - The report is to be completed in twelve months.

PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE [illegible]

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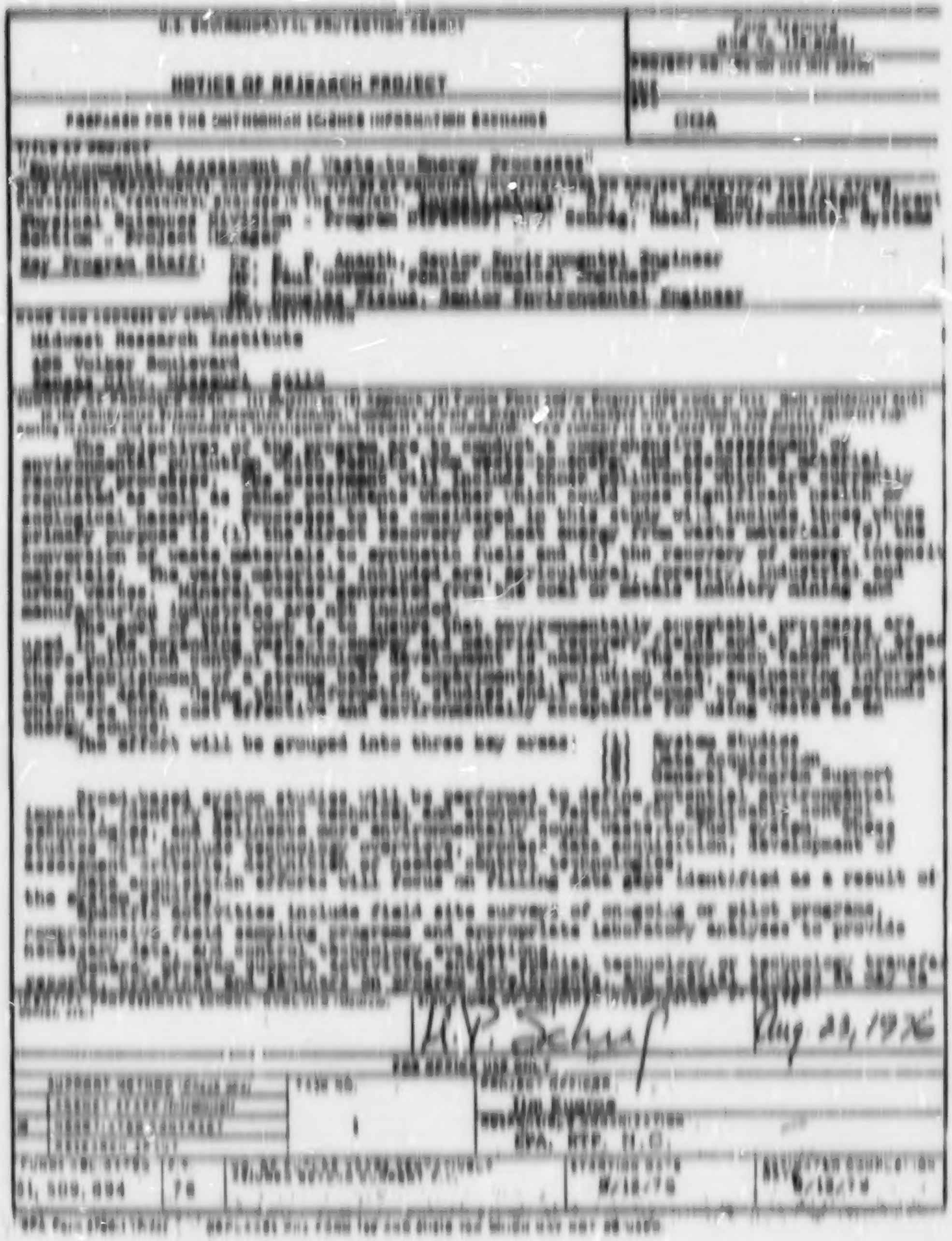
[illegible]	TASK NO. [illegible]	PROJECT OFFICER [illegible] [illegible] No. [illegible]	STARTING DATE 04/19/76	ESTIMATED COMPLETION DATE 04/19/77
9,500 [illegible]		[illegible]		

EPA Form [illegible] REPLACES [illegible] WHICH MAY NOT BE USED



U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

TITLE OF PROJECT:

"Environmental Assessment of Waste-to-Energy Processes"

[illegible] Physical Sciences Division - Program Manager; [illegible] Environmental Systems Section - Project Manager

Key Program Staff: Mr. [illegible], Senior Environmental Engineer
Mr. Paul [illegible], Senior Chemical Engineer
Mr. [illegible], Senior Environmental Engineer

NAME AND ADDRESS OF CONTRACTOR:
Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri 64110

The objectives of the program are to conduct a comprehensive assessment of environmental [illegible] recovery procedures. The assessment will include those pollutants which are currently regulated as well as other pollutants whether which could pose significant health or ecological hazards. Processes to be considered in this study will include those whose primary purpose is (1) the direct recovery of heat energy from waste materials (2) the conversion of waste materials to synthetic fuels and (3) the recovery of energy intensive materials. [illegible] urban wastes, [illegible] coal or [illegible] industry mining and manufacturing [illegible].

[illegible] environmentally acceptable [illegible] cost-effective and environmentally acceptable for using waste as an energy source.

The effort will be grouped into three key areas: (1) System Studies
(2) Data Acquisition
(3) General Program Support

Desk-based system studies will be performed to define potential environmental impacts [illegible] Development of [illegible]

Data acquisition efforts will focus on filling data gaps identified as a result of the system studies.

[illegible] activities include field site surveys of on-going or pilot programs, comprehensive field sampling programs and appropriate laboratory analyses to provide necessary data. [illegible]

[illegible]

Aug 23, 1976

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[illegible]	TASK NO.	PROJECT OFFICER
[illegible]	1	[illegible] EPA, RTP, N.C.

FUNDS [illegible]	FY	[illegible]	STARTING DATE	ESTIMATED COMPLETION
$1,509,884	76	[illegible]	8/16/76	6/18/79

EPA Form [illegible] [illegible]

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

PROJECT NO. [illegible]

TITLE OF PROJECT: [illegible]

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT:

Robert W. Levesque - Project Manager
David Bendersky - Principal Investigator

NAME AND ADDRESS OF AGENCY/INSTITUTION:

Midwest Research Institute
425 Volker Boulevard
Kansas City, Missouri

SUMMARY OF PROPOSED WORK [illegible]

The purpose of this project is to study technical and economic aspects of alternative pre-processing equipment and systems for converting municipal solid waste into a fuel or feedstock for fuel conversion systems. The study is intended to encourage, stimulate and advance the overall state-of-the-art of waste-to-energy systems. Present and planned equipment and installations will first be reviewed to determine research needs and establish priorities. A test plan will then be formulated, and field tests of existing equipment and systems conducted to provide design and operational information. The data base obtained will be evaluated to determine its adequacy for use in selection and design of pre-processing equipment in fuel and feedstock preparation processes for future waste-to-energy production systems.

[illegible] Economics and Management Science Division	SIGNATURE OF PRINCIPAL INVESTIGATOR David Bendersky	DATE April 1, 1976

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TASK NO. [illegible]

PROJECT OFFICER [illegible]

EPA Washington, D.C.

FUNDS OBLIGATED $48,975

F.Y. 76

STARTING DATE 3/19/76

ESTIMATED COMPLETION DATE 3/19/78

EPA Form [illegible]

I. ADVANCED SYSTEMS

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

PROJECT NO. [illegible]

EPA

TITLE OF PROJECT

Geothermal Resource Development Leasing, Siting, and Operating Guide

NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

NAME AND ADDRESS OF APPLICANT INSTITUTION

SUMMARY OF PROPOSED WORK [illegible]

With continued interest by the U.S. Government in obtaining energy self-sufficiency, there has been a growing interest in the development of alternative energy systems, not the least of which has been this country's geothermal energy resource. Realizing that a portion of any geothermal development may well occur in the Region VIII states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, the EPA wishes to determine the potential environmental impacts that such development may have on the region.

The intent of this project is the development of a two-part siting and leasing guide. Part one will be an executive summary which can be used by administrators and Governors' staff level people. Part two will be a detailed back-up document. This guide will address all Region VIII Known Geothermal Resource Areas (KGRAs) with particular emphasis upon those where development is occurring. The types of systems, process development and engineering details of recovery of the geothermal resource will be presented. A general overview of resource development in other regions and countries will be considered. The existing and expected Federal, State, and local constraints will be compiled. The expected air, water, and land effluents and impacts will be presented along with the mitigating measures necessary to control these impacts. Finally, the information needed prior to leasing and operation will be presented and suggested monitoring criteria and requirements will be developed.

The above will be done in conjunction with the EPA-Las Vegas project, entitled "Geothermal Systems/Environmental Assessment of Extraction, Conversion, and Waste [illegible]"

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (MEDICAL, DENTAL, ETC.)	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE

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SUPPORT METHOD (Check one) ☐ [illegible] ☐ [illegible] ☐ [illegible] ☐ [illegible]	TASK NO. 1A	PROJECT OFFICER T. W. Smith RESPONSIBLE ORGANIZATION EMSL, Las Vegas

FUNDS ALLOCATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE 6/78

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U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

[illegible]

TITLE OF PROJECT

Characterization of Emission and Combustion Performance of Alternate Fuels

[illegible] PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT.

G. B. Martin - Research Chemical Engineer

H. Butts

NAME AND ADDRESS OF EMPLOYING INSTITUTION

Environmental Protection Agency
Industrial Environmental Research Laboratory
Research Triangle Park, N. C. 27711

SUMMARY OF RESEARCH [illegible]

The objective of this project is to evaluate emission performance of alternate fuels and advanced concept control techniques. This evaluation provides an initial assessment of problems and/or promise of different technology approaches.

The study utilizes a 700,000 Btu/hr versatile experimental furnace for comparison of alternate fuel performance to previously established baselines for conventional fuel. The basic furnace allow for burner design changes as well as staged combustion and flue gas recirculation.

To date the project has evaluated : (1) fuel nitrogen conversion and control techniques for liquid fuels; and (2) alcohol fuels. A fuel gas generator system capable of producing simulated low Btu gases with variable CO to H_2 ratios, CH_4 content and NH_3 content at a range of temperatures from 300°F to 1500°F is being delivered. The effort will center on concepts for control fuel and thermal NO_x.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED (E.G., MEDICAL) N/A

SIGNATURE OF PRINCIPAL INVESTIGATOR

DATE

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SUPPORT METHOD: X [illegible]

TASK NO. N 11

PROJECT OFFICER: G. B. Martin

RESPONSIBLE ORGANIZATION: IERL-RTP, EACD, CRB

FUNDS OBLIGATED: $80,000

F.Y.: 78

[illegible]: Five

STARTING DATE

ESTIMATED COMPLETION DATE: 10/81

EPA Form 5760-1 (7-72) REPLACES [illegible] WHICH MAY NOT BE USED.

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF RESEARCH PROJECT

PREPARED FOR THE SMITHSONIAN SCIENCE INFORMATION EXCHANGE

Form Approved
[illegible]

PROJECT NO. (DO NOT USE THIS SPACE)
[illegible]
CBF

TITLE OF PROJECT
Preliminary Environmental Assessment of Biomass Conversion to Synthetic Fuels

[illegible] NAMES, DEPARTMENTS, AND OFFICIAL TITLES OF PRINCIPAL INVESTIGATORS OR PROJECT DIRECTORS AND ALL OTHER PROFESSIONAL PERSONNEL ENGAGED IN THE PROJECT

E. T. Ginnard	E. H. Wood	B. W. Vigon
W. E. Ballantyne	E. W. Connaby	
L. E. Burton	D. C. Matthews	
W. C. Dayton	R. A. Ewing	

NAME AND ADDRESS OF APPLICANT INSTITUTION

Battelle - Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

SUMMARY OF PROPOSED WORK [illegible]

This study was conducted to provide a preliminary evaluation of biomass production and conversion technologies, and their associated environmental consequences. Biomass, as used in this study, refers to materials which are either directly or indirectly the result of plant cultivation. Since a substantial portion of the organic fraction of urban and industrial wastes are the "indirect" result of plant growth (that is, plant materials, especially fibers which have already been utilized in some fashion), they are considered biomass as well.

Five categories of biomass production were considered in detail: agricultural and forestry wastes, aquaculture (aquatic plant species which may be cultivated for energy production), silviculture (intense cultivation of tree species), energy crops (special crops adaptable to intense cultivation for the production of energy), and urban and industrial wastes.

The conversion processes which were considered were classified as thermochemical and biochemical technology. Primary thermochemical processes which were reviewed in detail were direct conversion (including combustion), pyrolysis, and hydrolysis. Less developed technologies, in particular, hydrogenation and novel process processes, were also briefly analyzed. Primary biochemical processes considered in detail included anaerobic digestion and enzymatic hydrolysis. Secondary processes, (that is, processes which convert products from primary processes to useful fuels), were also evaluated and included methanol and other Fisher-Tropsch-type products from synthesis gas, ethanol production from sugar solutions, and several minor process systems. Six regionalized scenarios (brief studies of commercial scale plants processing appropriate regionalized feedstock) were prepared as part of this work. A seventh scenario, directed at a mobile facility was also prepared.

IDENTIFY PROFESSIONAL SCHOOL INVOLVED [illegible]	SIGNATURE OF PRINCIPAL INVESTIGATOR	DATE
		10-7-78

FOR OFFICE USE ONLY

SUPPORT METHOD [illegible]	PROGRAM ELEMENT NO.	PROJECT OFFICER
[illegible] [illegible] ● [illegible] [illegible]	68-03-03A	Thomas J. Powers RESPONSIBLE ORGANIZATION IERL-Cincinnati, EPA, OHD

FUNDS OBLIGATED	F.Y.	[illegible]	STARTING DATE	ESTIMATED COMPLETION DATE
$ 90,000	78	None	February 1978	December 1978

EPA Form 5700-1 (7-73) REPLACES PHS FORM [illegible] WHICH MAY NOT BE USED.